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THERAPY OF LOW BACK PAIN BY MANIPULATION AND OF REFERRED PAIN IN THE LOWER EXTREMITY BY PROCAINE INFILTRATION *

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and

WILLARD TRAVELL, M.D.

NEW YORK

Because of the frequency of intractable low back pain in the military services and in civilian life, and because of the increasing application of our technic[1] for manipulation of the sacroiliac joint in the treatment of this syndrome, we wish to call attention at this time, first, to certain supplementary experiences which we have had with this procedure and second, to an adjunct of manipulation, namely, analgesic infiltration of the muscles, which has proved useful whenever referred pain in the lower extremity and muscle spasm are prominent concomitants of sacroiliac slip or displacement. It is not the purpose of this paper to review the manifold causes and the differential diagnosis of lumbosacral and sciatic pain, but we propose rather to discuss certain practical aspects of the therapy of these related syndromes when sacroiliac manipulation is thought to be indicated.

Sacroiliac Manipulation

For orientation, the following illustration of our "corkscrew" manipulation of the sacroiliac joint is reproduced from Bierman's recently published text,[2] This figure (fig. 1) shows the relative positions of the patient and of the operator at the end of the spiral thrust, whereas the figure in our original publication[1] shows these somewhat earlier in the maneuver.

Briefly to review the manipulative procedure, it may be seen (fig. 1) that the patient lies on the affected side, facing the operator. With the leg beneath straight and the leg uppermost slightly flexed and with the uppermost arm hanging loosely behind the back, steady increasing pressure ending in a quick final thrust is exerted to push the shoulder backward and to carry the entire buttock forward and upward in a "corkscrew" or spiral curve. The directions of force applied through the operator's hands are indicated in figure 2. From this it may be seen that the maneuver produces rotation and hyperextension of the spine together with rotation and tilting of the pelvis. The net result is a forward rotation of the upper part of the sacrum on the ilium beneath, which is immobilized by the weight of the patient's body. The axes of rotation of the ilium on the sacrum around a horizontal axis have been described by Gray.[3]

At this time we wish to emphasize a precaution to be taken in carrying out the manipulation, as to where not to place the hand which exerts pressure against the uppermost hip. If this hand is placed too high, that is, over the great trochanter rather than against the ischial tuberosity and sacrum, the leverage may be transmitted through the femur to the uppermost ilium in

* From the Department of Pharmacology, Cornell University Medical College, New York.

1. Travell, W., and Travell, J.: Technic for Reduction and Ambulatory Treatment of Sacroiliac Displacement, Arch. Phys. Therap. 23:222 (April) 1942.

2. Bierman, W.: Physical Medicine in Clinical Practice, New York, Paul B. Hoeber, Inc., 1944, p. 442.

3. Gray, H.: Sacroiliac Joint Pain: II. Mobility and Axes of Rotation, Internat. Clin. 2:65 (June) 1938.

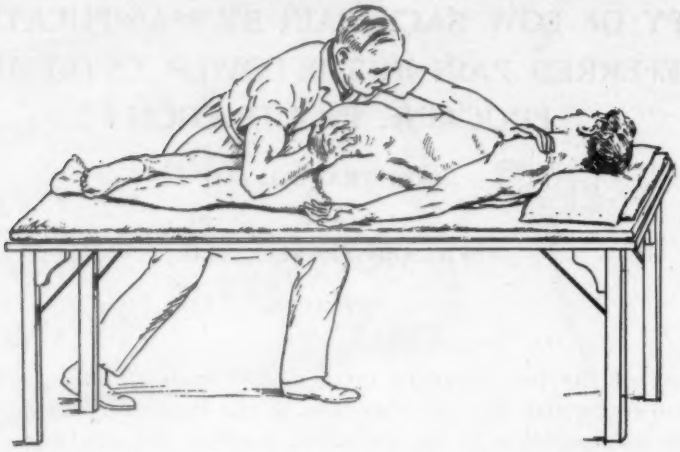

Fig. 1. — Illustration of the "corkscrew" manipulation of the right sacroiliac joint reproduced from Bierman.2 Note that the patient lies on the affected side. The operator stands in front of the patient almost opposite the knees and leans well over the patient, so that the full weight of the shoulder and arm may be brought to bear against the sacrum. It may be seen that the operator's position necessitates a long straight arm reach to rotate the shoulder backward while at the same time the sacrum and hip are carried forward and upward in a spiral curve. (From Bierman, "Physical Medicine in General Practice," Paul B. Hoeber, Inc., 1944).

such a way as to rotate the ilium forward in relation to the upper part of the sacrum and thus to produce pain and possibly displacement in the uppermost sacroiliac joint. When the maneuver is correctly executed, however, the application of force directly through the sacrum, as shown in figure 2, produces the reverse effect in the lowermost sacroiliac joint, namely, forward rotation of the upper part of the sacrum in relation to the ilium beneath.

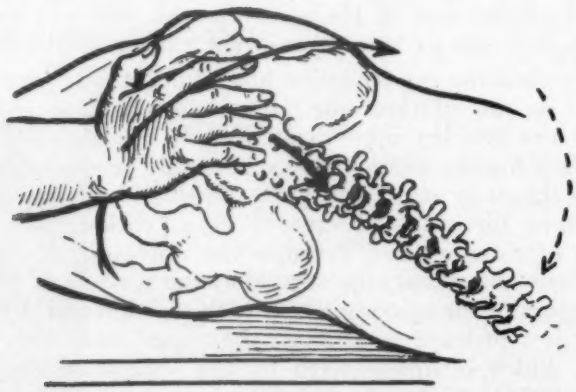

Fig. 2. — Correct position of the hand in relation to the sacral and pelvic bones. The long arrows indicate the direction of push of the operator's hands, and the short center arrow suggests the spiral rotation of the sacrum around a transverse axis through the lowermost sacroiliac joint.

We have observed no ill effects from the use of this manipulation without anesthesia in over 400 patients with low back pain, in whom inflammatory, malignant or degenerative bony disease and injury of the spine or pelvis had been ruled out by adequate preliminary examination. Even in the hands of a physician who is relatively inexperienced in manipulation, when the aforementioned precautions as to technic and diagnosis are exercised, we know of no deleterious effects of this procedure. One reason for

this may be the fact that, owing to the relative painlessness of the properly executed maneuver, we have not found it necessary to use general anesthesia in conjunction with the manipulation. We believe that the simplicity of the manipulation and the dramatic relief of pain and disability sometimes secured thereby warrant a more extensive application of this therapeutic procedure early in the course of low back pain of obscure origin.

The following is a typical report of a patient treated by this technic in North Africa in April, 1943, described in a letter from Lieut. Col. L. W. Hanlon.[4]

CASE 1. — "The patient was a 22 year old white male whom I saw about 2:00 o'clock one afternoon. He had been unable to get out of bed since awakening early that morning because of severe, stabbing pain in his lower back felt on any movement. There was no history of injury or of previous back trouble. He had been sleeping on the ground in a pup tent, where I examined and treated him.

When I saw him, the patient appeared anxious and worried but had pain only following movement involving his back. The pain was localized to the low back, particularly on the left. There was acute tenderness to pressure and percussion over the left sacroiliac joint. Back twisting and voluntary straight leg raising caused pain in that region. There was no sciatic radiation or tenderness. There was spasm of the low spinal muscles which relaxed somewhat after a few minutes of reassurance and massage. There was free motion of both hip joints.

Any change of position was so painful to the patient that I did not wish to move him, and manipulation was done on the ground in the pup tent, according to the technic which you and your father have described. After about thirty seconds of sustained pressure against the patient's right shoulder, to rotate the shoulder posteriorly, and at the same time against the patient's right ischial tuberosity, to elevate the pelvis and rotate it anteriorly, a click was heard, accompanied by a twinge of pain in the left sacroiliac region. He was immediately able to move his back freely without pain and got up and walked without difficulty. There was some residual tenderness to deep pressure and fist percussion over the left sacroiliac joint for a few days.

He was relieved from heavy duty for two weeks and was cautioned against activity which would cause sudden or severe twisting strain of his back. It was not possible to arrange for any change in his sleeping arrangements.

There was no recurrence of his back trouble during the following year.

This patient is only one of several whom I have treated successfully by this method of sacroiliac manipulation while in the Army. The results in this case were the most dramatic, however, since the procedure immediately enabled a man to resume activity who had been unable to get out of bed for eight hours because of the intense pain in his back."

A similar dramatic case was reported to us by Dr. Herbert Berger.[5]

CASE 2. — "On October 2, 1941, I was called to see Mr. S. D., a white man 42 years old. He had been working alone on a scaffold, painting the outside of a building. The scaffold was secured to the roof by rope, and Mr. D. lowered it by alternately releasing the rope at one end of the scaffold and then at the other. While so releasing the rope, he had to lean forward in a position which also necessitated that he bend sidewise. Once the rope got away from him, and he grabbed at it to keep the scaffold from dropping to the ground. As he did so, he experienced a sudden severe pain in the right side of his back which radiated down his leg. He was able to fasten the rope while he lay in a bent-over, twisted position, from which he could not move.

One of the other workmen called me at my office, and I cautioned him to leave Mr. D. exactly where he was until I got there. On arriving at the scene, I found the patient lying on his right side on the scaffold, which had been lowered to the ground. He was unable to move because of the severe pain experienced. Examination showed tenderness over the right sacroiliac joint, and he was, therefore, treated by manipulation as you have described. There was a sudden loud "snap," and the patient experienced immediate relief, got to his feet and continued his work. Subsequently he did not miss any time from his job.

Since then I have served as the family physician and have been continually in touch with Mr. D. and his wife. In the past four years he has continued to do heavy

4. Hanlon, L. W.: Personal communication to the authors.
5. Berger, H.: Personal communication to the authors.

work, laboring in a shipyard during the war, and he has made no further complaint as to his back."

One of the difficulties in the diagnosis of sacroiliac slip is the uniform failure of the customary roentgenograms to demonstrate any disalignment of the sacrum and ilium, because motion in these joints occurs not in an up and down direction but in a rotary manner around a horizontal axis. A special technic devised by Chamberlain[6] for roentgen examination of the sacroiliac articulation measures the degree of shift at the symphysis pubis following sacroiliac slip and affords proof that rotary displacement of the sacroiliac joint does take place in cases of low back pain of the type we have described.[1] Anderson and Peterson[7] have reported that in their hands Chamberlain's technic for demonstrating abnormal motion in the sacroiliac joint gave positive evidence of sacroiliac slip in 82 per cent of the cases in which this diagnosis was made clinically. This study confirms our contention that a minor degree of displacement or "slipping" of the sacroiliac joint is, in fact, one of the manifold causes of the confused syndrome of low back pain and that the dramatic relief of pain and disability secured by the manipulation described is in all probability due to the reduction of such a displacement.

Intramuscular "Analgesic" Infiltration

For the relief of pain due to reflex muscular spasm an important adjunct to sacroiliac manipulation is the infiltration of the spastic muscles with procaine hydrochloride (0.5 per cent solution) or even with isotonic solution of sodium chloride. The latter is somewhat more painful but is also effective. The pain of complicating muscle spasm apparently arises in so-called trigger zones[8] in the spastic muscles, from which pain is referred to areas usually located at a distance from its source in the trigger zone. Thus, shortly after sacroiliac displacement, referred pain may appear in a part or in the whole of the sciatic distribution, giving rise to the clinical syndrome of "sciatica." Anderson and Peterson[7] noted associated leg pain in 46 per cent of their series of 62 cases of sacroiliac slip, whereas we reported a similar radiation of pain in 44 per cent of 162 such cases.[1]

Gluteus Minimus Syndrome. — Although any one of a number of muscles may be responsible for the radiation of pain, we have observed that following sacroiliac displacement referred pain in the lower extremity results from the development of trigger zones located more frequently in the gluteus minimus than in any other muscle. Next to the gluteus minimus, the lumbar erector spinae muscles are most apt to exhibit a trigger mechanism after sacroiliac slip. The reference of pain from the inferior end of the latter group of muscles in the "multifidus triangle" has been described by Livingston.[9] Other muscles which commonly develop trigger areas after sacroiliac displacement include the gluteus medius, gluteus maximus and the pyriformis and less frequently the adductors of the thigh.

The distribution of pain referred from trigger zones in the gluteus minimus muscle, which so far as we know has not been mapped heretofore, is shown in figure 3. These diagrams (fig. 3A and B) represent the composite experience secured in 140 cases of low back pain with radiation of pain to the lower extremity in which pain reference from the gluteal muscles was

6. Chamberlain, W. E.: The Symphysis Pubis in the Roentgen Examination of the Sacroiliac Joint, Am. J. Roentgenol. 24:621 (Dec.) 1930; the X-Ray Examination of the Sacroiliac Joint, Delaware State M. J. 4:195 (Sept.) 1932.

7. Anderson, R. L., and Peterson, V. L.: Clinical Use of the Chamberlain Technic in Sacroiliac Conditions, J. A. M. A. 124:269 (Jan. 29) 1944.

8. Steindler, A., and Luck, J. V.: Differential Diagnosis of Pain Low in the Back, J. A. M. A. 110:106 (Jan. 8) 1938.

9. Livingston, W. K.: Back Disabilities Due to Strain of the Multifidus Muscle: Cases Treated by Novocain Injection, West. J. Surg. 49:259 (May) 1941.

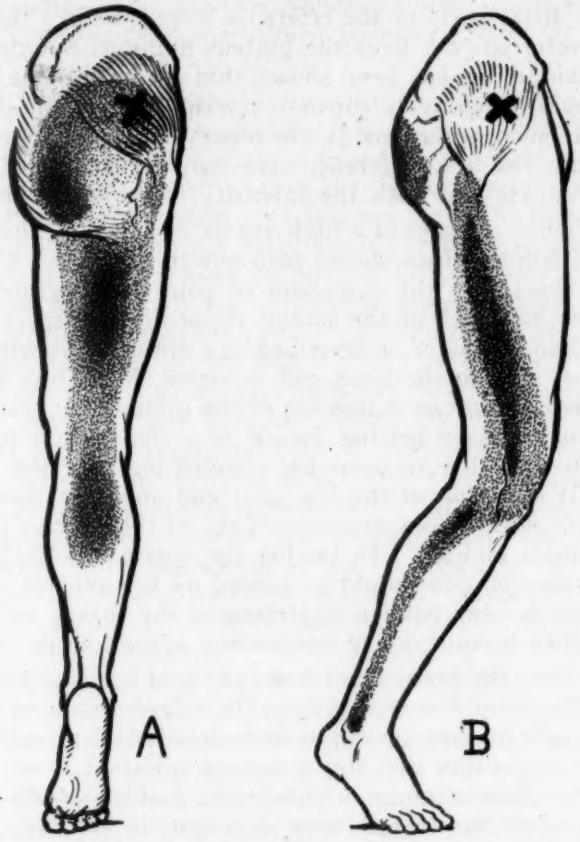

Fig. 3. — Pain reference areas for trigger zones located in different parts of the gluteus minimus muscle: (*A*), in the medial or posterior section, and (*B*), in the lateral or anterior section of this muscle. The site of the trigger area is marked *X*, and the corresponding pain reference area is stippled. The heavier shading indicates the regions in which the referred pain is usually perceived most intensely.

studied by the technic of infiltrating trigger areas within the muscles. In these individuals with spontaneous pain, infiltrating, or merely needling, the trigger zone elicits or accentuates the pain perceived in the reference zone. The referred pain induced in this way persists for an appreciable period, sometimes for several minutes, and its distribution can usually be clearly delineated by the subject. This technic for studying referred somatic pain by means of needling abnormal foci or trigger areas which have developed spontaneously is somewhat analagous to the method of mapping pain reference areas by injecting hypertonic salt solution into normal structures,[10] but the former is advantageous in that it affords information not only regarding the distribution of referred pain from specific regions but also concerning the myalgic syndromes which one encounters clinically.

It may be seen that the total reference area from trigger zones located in the medial or posterior part of the gluteus minimus muscle (fig. 3A) includes the entire buttock, the posterior aspect of the thigh and the calf. In the case of trigger zones located in the lateral or anterior portion of the muscle (fig. 3B), the reference area includes the lower part of the buttock, the anterolateral aspect of the thigh, the knee and the peroneal line of the leg. At times, the reference of pain extends only to the buttock or thigh and

10. Kellgren, J. H.: On the Distribution of Pain Arising from Deep Somatic Structures with Charts of Segmental Pain Areas, Clin. Science 4:35 (June 5) 1939.

not to the more distal parts of the reference zone. Unlike the pain of true sciatic neuritis, referred pain from the gluteus minimus muscle does not extend below the ankle. It has been shown that in general the pattern of referred somatic pain is relatively constant for the site of stimulation,[10] and it seems likely that such variations as are observed in the distribution of referred pain within the total reference area may be correlated with specific sections of the muscle and with the intensity of the pain stimulus.[11]

The chief clinical features of a high degree of spasm of the gluteus minimus muscle as a whole, which should lead one to search for trigger areas in this muscle, include: (1) the complaint of pain in the gluteal region and thigh, sometimes localized to the lateral or posterior aspect of the thigh but often shifting in character or described as a diffuse ache with intermittent sharp radiation of pain to the knee, calf or outer side of the lower leg; (2) pain and restricted motion on active use of the gluteus minimus muscle, i. e., a limp on walking, pain on getting up out of a chair or on turning over in bed and especially inability to cross the affected leg over the opposite knee when sitting; (3) elevation of the hip joint and apparent shortening of the affected extremity with a compensatory "list" of the pelvis; (4) absence of abnormal neurologic findings. In testing for spasm involving only limited portions of this muscle, one should be guided by the general rule that those movements which involve passive stretching of the spastic section are painful and those which involve active contraction appear weak.

On examination, the presence of a trigger area is discovered by eliciting localized muscular tenderness and, if possible, referred pain on firm sustained pressure. The trigger mechanism can be demonstrated most easily if the patient is placed in such a position that the muscle in question is stretched. Thus, in the case of the gluteus minimus muscle the patient should lie on the opposite side, and when the trigger zone is sought in the medial part of the muscle (fig. 3*A*), the uppermost leg is flexed to about 90 degrees at the hip with the leg beneath straight, whereas when it is sought in the lateral portion (fig. 3*B*), the position of the legs is reversed. The depth of these trigger zones beneath the skin is such that in the average-sized person a 3-inch needle (22 gage) is required to infiltrate them adequately.

When a very acute trigger area is blocked, a sensation of heaviness or weakness of the extremity, "as if it were paralyzed," may ensue within a minute or two after infiltration, even when saline solution is employed. The muscle in question behaves as if curarized and will respond to a voluntary stimulus by a brief contraction but is unable to maintain a sustained effort. This effect may last fifteen or twenty minutes. Thus, when trigger areas in the gluteus minimus muscle are infiltrated and the patient attempts to stand on the leg immediately, the hip may "give way" so that he actually falls. The precaution should be taken, therefore, of allowing the patient to rest for a suitable period of time after the injection and of testing the motor power of the leg as he first stands on it.

In our experience, trigger zones in the gluteus minimus muscle account to a large extent for radiating pain in the lower extremity in the absence of neurologic signs, not only in cases of sacroiliac displacement but also in many other cases of obscure low back pain. Trigger zones in this muscle apparently bear the same general relation to pain in the hip and leg as such abnormal foci in the infraspinatus muscle do to myalgias of the shoulder and arm.[12] The frequency of such trigger mechanisms in the gluteal and

11. Travell, J., and Bigelow, N. H.: Referred Somatic Pain Does Not Follow a Simple "Segmental" Distribution, Federation Proc. 5:106 (Feb.) 1946.
12. Travell, J.; Rinzler, S., and Herman, M.: Pain and Disability of the Shoulder and Arm; Treatment by Intramuscular Infiltration with Procaine Hydrochloride, J. A. M. A. 120:417 (Oct. 10) 1942.

lumbrosacral regions is indicated by Kellgren's observation[13] that in patients with sciatica, "ligamentous and muscular lesions form by far the commonest source of pain" (50 out of 70 cases).

Infiltration Technic. — To abolish the muscular spasm and resultant referred pain by means of local injection therapy, it is essential that the trigger zones be infiltrated rather than the structures in the areas where pain is perceived, that is, in the reference zones.[12] Since the deeper structures, and occasionally even the skin, in a reference zone become tender to pressure during the reference of pain, the presence of such referred tenderness may be a source of confusion in the selection of sites for infiltration. Hence, until the common myalgic syndromes and their pain reference patterns have been described, one must learn through experience or by trial and error the probable sources of referred pain perceived in any given region of the body. In evaluating the immediate effect of a given injection, one may conclude that a trigger area has been "hit" and adequately infiltrated provided: (1) a clear reference of pain is set off by the insertion of the needle; (2) deep muscular tenderness at the site of injection disappears within a few minutes; (3) spontaneous pain and tenderness in the reference zone disappear or diminish; (4) there is an appreciable increase in the range of motion. Other details of the injection technic and the nature of the reactions to procaine when this material is used have been recently discussed.[14] Regarding the safety of this method of therapy of low back pain and sciatica, we agree with Brav and Sigmund[15] who conclude: "Provided that injections are made under aseptic technique and provided that no harmful or unduly irritating substance is injected, there are no contraindications to the injection treatment."

When sensitivity to procaine is suspected, isotonic solution of sodium chloride may be used for infiltration, since in our experience and in the hands of others[15] the latter material is of the same order of therapeutic effectiveness as procaine. It likewise abolishes the acute deep muscular tenderness at the site of the trigger area within two or three minutes after injection just as procaine does when identical technics of injection are employed. That is, when one is dealing with a clearcut trigger mechanism, if the first trial fails to abolish tenderness, persistent reinjection with the same solution will almost always do so, with consequent relief of the pain and limitation of motion. This procedure differs from that suggested by Steinbrocker as the saline-procaine test, which "consists in the consecutive injection of isotonic sodium chloride and procaine solutions at the site of soreness elicited by palpation."[16] Our observations regarding the similarity of the effects of infiltration with saline and procaine solutions are in contrast to Steinbrocker's, who concluded that differences in the effectiveness of these materials in local analgesic therapy may be used as a measure of the importance of psychogenic factors in the causation of the pain. Since a single or repeated infiltration with isotonic solution of sodium chloride without procaine, or even merely needling the muscle,[15] may lead to immediate and permanent disappearance of spasm and referred pain, it appears that a vicious cycle responsibility for some physiologic disorder must have been interrupted in some manner other than by a simple local anesthetic action.

In our experience, treatment by local infiltration of trigger areas within the muscles, when properly carried out, relieves pain referred from these

13. Kellgren, J. H.: Sciatica, Lancet 1:561 (May 3) 1941.
14. Travell, J.: Conference on Therapy: Management of Pain Due to Muscle Spasm, New York State J. Med. 45:2095 (Oct. 1) 1945.
15. Brav, E. A., and Sigmund, H.: Local and Regional Injection Treatment of Low Back Pain and Sciatica, Ann. Int. Med. 15:840 (Nov.) 1941.
16. Steinbrocker, O.: Therapeutic Injections in Painful Musculoskeletal Disorders, J. A. M. A. 125: 397 (June 10) 1944.

sources more effectively than any other therapeutic procedure, not excluding the use of morphine. The variety and impressiveness of many of the procedures to which the patient had frequently been subjected without benefit prior to local injection therapy seems to preclude the likelihood that the consistent benefits derived from the latter are the results of purely psychogenic factors.

Muscle Spasm and Sacroiliac Slip. — Although not subject to direct proof, it is our impression that in the patient with sacroiliac slip in whom muscle spasm with referred pain is a prominent feature, the infiltration of such trigger zones following reduction by manipulation materially shortens the period of pain and disability. An illustrative case report follows.

CASE 3. — Mrs. B. S., a white housewife, formerly a chambermaid, referred by Dr. Bettina Warburg, was first seen on April 27, 1944, because of the complaint of severe low back pain of more than a year's duration, dating from her third and last pregnancy. Backache became noticeable during the last three or four months of the pregnancy, but it was so much worse following delivery (April 15, 1943) that on leaving the hospital she said she "couldn't stand up." When the patient was first seen, the pain was on the whole less intense than it had been a year earlier. The pain was felt diffusely in the lumbosacral region and across both sacroiliac joints, worse on the right side, and occasionally radiating into the hip and buttock. It was induced by turning over in bed, by lifting her baby and by getting up after she had been sitting, when it took a minute or two for her to straighten up. Rest pain was absent except for a constant backache for a day or two before the onset of and during the menses. Dysmenorrhea was marked, with cramplike pain radiating to the rectum and coccyx. The patient wore a pessary and complained that "she always felt the womb pulling down when she walked." She said that this, together with the backache, made her irritable at home with the children and that she was always tired, so much so that she had "crying spells." She had had no special treatment other than local heat.

The patient had had two previous pregnancies with normal deliveries; the children were 1, 4 and 8 years of age. Backache had also been present during the second pregnancy, but it was of moderate severity and subsided spontaneously. No other complaints of pain except "tired aches" in the shoulders were elicited.

The past history revealed several operations: tonsillectomy (1929), appendectomy (1930) and cholecystectomy for cholelithiasis (1933). During the last hospitalization a small nontoxic adenoma of the thyroid was resected. Late in the last pregnancy, a preeclamptic state developed and labor was brought on by medical induction. Following delivery the blood pressure returned to normal and the blood urea nitrogen and results of renal function tests (phenolsulfonephthalein and urea clearance) were also normal.

Examination at the first visit showed the range of motion of the spine to be excellent and straight-leg raising and other leg motions not restricted. The patient could put both hands on the floor when standing with feet together and knees straight. However, bringing the right knee to the chest produced a distinct pain in the region of the right sacroiliac joint. There was marked tenderness on palpation over the right sacroiliac joint and to a lesser degree over the corresponding joint on the left. There was relatively little deep muscle tenderness on palpation, although isolated spots of tenderness were found in the lower spinal and gluteal muscles. The knee and ankle jerks were normal, and there was no disturbance of cutaneous sensation. There was a marked reduction in vibratory sense, which was barely present in the toes and was appreciably reduced in the fingers. Other abnormalities were varicose veins of both legs, slight pitting edema of the ankles and obesity (weight 150 pounds, height 5 feet 2 inches). The blood pressure was 130/85.

After the examination, manipulation of both sacroiliac joints was carried out according to the technic we have described. The patient was able to relax well, and the maneuver was easily carried out with little force. On manipulation of the left sacroiliac joint, a very loud knock was produced, and in the case of the right sacroiliac joint a small click was heard.

On account of the peripheral neuritis and complaint of general fatigue, thiamine hydrochloride, 100 mg. was given intramuscularly. This medication was repeated at each subsequent visit.

Arrangements were made for roentgenograms to be taken, but the patient felt so much better following the first treatment that she refused to undergo this expense.

A week after the first treatment the patient reported that the pain on the left side of the back was entirely gone, and no tenderness could be elicited over the left

sacroiliac joint. Some pain persisted on the right side of the back and especially in the right buttock which "hurt on the bone where she sat," and she commented on pain in the right hip when walking. She volunteered the information that the "womb did not pull any more." At this time manipulation of the sacroiliac joints elicited a barely perceptible click on each side. A localized area of acute deep muscle tenderness was found in the right midgluteal region, which was infiltrated with 10 cc. of 0.25 per cent solution of procaine hydrochloride. Except for this one occasion, isotonic solution of sodium chloride was used throughout for local infiltration. The injection induced a widespread reference of pain in the entire gluteal region felt most intensely low in the right buttock (fig. 4*A*).

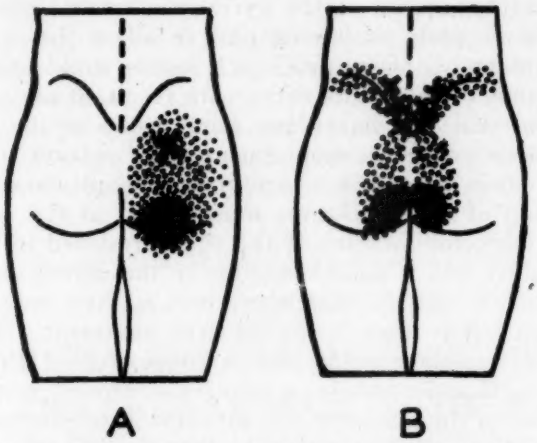

Fig. 4. — Trigger zones (*X*) and corresponding pain reference areas in patient B. S. (case 3), which were infiltrated (*A*) in the right gluteus minimus muscle (second visit), and (*B*) in the erector spinae muscles bilaterally (third visit).

A week later the patient reported marked improvement. She noticed that she could now turn over in bed without pain. The pain in the right buttock and thigh had disappeared except for twinges on the day after treatment. She remarked that she could now walk as fast as she pleased or "even run" and that she was noticeably less nervous and irritable. The only complaints were of some stiffness on rising from a chair and of an ache low over the sacrum and in the coccyx at times, elicited on examination by full flexion of the spine. At this visit sacroiliac manipulation elicited no audible sounds. Trigger areas in the inferior ends of the erector spinae muscles in the multifidus triangle on both sides were infiltrated with isotonic saline solution. The reference of pain from the several sites traveled laterally over the pelvic crest and downward over the sacrum, coccyx and medial aspect of the buttocks (fig. 4*B*). At this time a few simple spinal exercises were instituted, which she carried out conscientiously.

Subsequently, the patient returned at intervals of two or three weeks for a total of nine visits extending over three and one-half months (April 27 to Aug. 14, 1944). At each visit sacroiliac manipulation was done as a routine measure. Once there was an exacerbation of lumbosacral pain following a trip to the beach when she walked through deep sand carrying the baby, and thereafter sacroiliac manipulation again elicited a loud "knock" on the left side. At each visit a few trigger areas were found in the low erector spinae or gluteal muscles which were infiltrated with isotonic salt solution. During the last six weeks of treatment, she was almost entirely free from pain and "could even work in the garden without backache." She also reported that her last menses occurred without cramps for the first time in years and that she "never felt the womb drop down now," which suggests that these symptoms may have represented disturbances referred from the somatic structures.

A follow-up in March revealed no recurrence of back pain, and again, in October, 1945, more than a year after the final treatment, the patient reported that "she felt just wonderful, had gained 8 pounds and never had any more trouble with her back."

This case illustrates the general procedure when sacroiliac manipulation and local injection therapy are combined. It is also representative of the results of treatment secured in a group of 15 cases of lumbosacral, and in most instances "sciatic," pain characterized by onset during pregnancy or delivery. Since it is well known that separation of the sacroiliac joints

occurs ante partum to enlarge the pelvic outlet,[17] it is not surprising that these cases should prove particularly amenable to treatment by sacroiliac manipulation.

As we have indicated,[1] the referred pain which may accompany or follow displacement of the sacroiliac joint is not associated with neurologic changes such as impairment of cutaneous sensation or loss of deep reflexes, except possibly under certain rare circumstances when spasm of the pyriformis muscle may become a serious complication of sacroiliac displacement. Theoretically, if protracted spasm of the pyriformis muscle occurs in a person with the anatomic anomaly of having part or all of the sciatic nerve pass through the substance of this muscle, such spasm could cause compression, and perhaps ischemia, of the sciatic nerve with resultant nerve injury. Beaton and Anson[18] found that this hazardous relationship of the sciatic nerve to the pyriformis muscle existed in about 8 per cent of cadavers. We have treated 2 patients in whom reduction of a sacroiliac displacement together with procaine infiltration of the pyriformis muscle, and at the same time of the painfully spastic adductor muscles of the thigh, resulted in immediate relief of pain and disability and a rapid reduction in the extent and degree of hypesthesia in the sciatic distribution; there was marked improvement in sensation within twenty-four hours after the first treatment. Alhough the evidence afforded by this therapeutic test is suggestive of sciatic nerve compression by the pyriformis muscle, a positive diagnosis could be confirmed only by verification of the anatomic relationships at postmortem examination. Skillern[19] has likewise called attention to the possible role of spasm of the pyriformis muscle in causing compression of the sciatic nerve following sacroiliac strain and to another analgesic infiltration technic for securing relaxation of this muscle.

In evaluating the results of treatment by manipulation and local infiltration of trigger areas, we have come to the conclusion that in cases of sacroiliac displacement with severe referred pain due to muscle spasm the judicious combination of these procedures affords the most rapid and protracted relief. However, when reduction of the sacroiliac displacement is not achieved and maintained, by repeated manipulation if necessary, local infiltration and other types of treatment aimed at relaxing spasm of the muscles will commonly fail to secure more than transient relief of pain so long as the displacement is allowed to persist. This view is in harmony with Livingston's concept:[20] "In many cases (of chronic low back disability), particularly those in which some abnormal tension or mechanical pinching of tissues persists, it is not to be expected that treatment (novocaine injections of trigger points) will do more than confer temporary relief. It is quite possible that treatment may succeed in breaking up the pathologic process for a time, but the factors which contributed to the onset of the trouble remain to start it all over again."

Summary and Conclusions

1. The details of a technic for sacroiliac manipulation are reviewed. and certain precautions to be observed in its use are presented.

2. The application of this manipulative procedure without anesthesia in over 400 selected cases of low back pain has had no known deleterious effects and in many instances has secured immediate and dramatic relief of pain and disability.

17. Thorp, D. J., and Fray, W. E.: The Pelvic Joint During Pregnancy and Labor, J. A. M. A. 111: 1162 (Sept. 24) 1938.

18. Beaton, L. E., and Anson, B. J.: The Sciatic Nerve and the Pyriformis Muscle: Their Interrelation a Possible Cause of Coccygodynia, J. Bone & Joint Surg. 20:686 (July) 1938.

19. Skillern, P. G.: The Relief of Painful Thigh Stump and Sciatica, J. A. M. A. 126:514 (Oct. 21) 1944.

20. Livingston, W. K.: Pain Mechanism, New York, The Macmillan Company, 1943, p. 134-139.

3. This manipulative technic, because of its simplicity, safety and effectiveness, warrants an early trial in the syndrome of low back pain.

4. A myalgic syndrome due to spasm of the gluteus minimus muscle is described, which is a frequent complication of sacroiliac displacement and which gives rise to the clinical picture of "sciatica."

5. The reference of pain from different parts of the gluteus minimus muscle was studied in 140 patients with lumbosacral pain and radiation of pain to the lower extremity by the technic of needling spontaneous trigger areas in the muscle.

6. Details of treatment of the gluteus minimus syndrome by infiltration of trigger areas with procaine hydrochloride or isotonic solution of sodium chloride are discussed.

7. Attention is called to the possible role of spasm of the pyriformis muscle in causing damage to the sciatic nerve, which has been observed as an infrequent complication of sacroiliac displacement.

PHYSICOPYREXIA AND THE BIOLOGIC HEALING OF EARLY AND LATE SYPHILIS OF THE RABBIT *

A. BESSEMANS AND A. DENOO

It is well known that chemotherapy alone rarely, if ever, brings about a biologic or complete cure of syphilis. The symptoms of the disease may be diminished almost beyond recognition, but it is most difficult to eradicate the last few remaining Treponema. This is especially true when the disease is chronic and in its later stages. General hyperthermia awakened new hopes.

Local thermotherapy produced by physical means or "physicopyrexia" was introduced in the treatment of syphilis. However, the results were not as successful as had been expected. This was due to the resistance to heat of the treponemata located in the lymph nodes adjacent to the primary or secondary syphilitic lesions. It was then decided to combine chemotherapy with physicopyrexia. Numerous physicians reported on the results of these treatments in human beings. These results were very gratifying Richet and Dublineau and Joly; Bland; Hinsie and Blalock; Paulian; Simpson; Solomon and Epstein; Neymann, Lawless and Osborne; Ebaugh, Barnacle and Ewalt; Neymann; Menagh; Simpson and Kendell; Bennett and Lewis; Richet, Surmont and Le Go.

Richet and Dublineau and Bessemans had treated rabbit syphilis and thus had an opportunity to observe the effects of chemotherapy combined with physicopyrexia. They concluded that better results were obtained when the two methods of treatment were used concurrently than when each method was used separately. However, since the advantages of the combined method had never been thoroughly proved, we decided to reinvestigate the entire question.

One hundred and fifty-four male rabbits were infected with syphilis of the Ghent strain. These were divided into three groups, each group being

* From The Josiah Macy, Jr., Foundation and the Experimental Medical Hyperthermic and Therapeutic Service of the Belgian State University, Ghent, Prof. A. Bessemans, Director.

* This paper was written in 1941, but because of war conditions it could not be submitted for publication until 1946.

composed of animals with or without clinical lesions. In some the disease had not been present for more than four months (early period), in others without apparent lesions it had been present for from six to sixteen months (late period).

The first group was treated with arsphenamine. The second was treated by "physicopyrexia." The third group was treated by the two methods simultaneously.

The therapy with arsphenamine consisted of three intramuscular injections at intervals of three or eight days of 0.25 or 0.5 cc. of Bayer s solusalvarsan, (a 10 per cent solution) for each kilogram of body weight, i. e., a total dose corresponding to from 4.5 to 9 Gm. in a man weighing 60 Kg.

For treatment with physicopyrexia the rabbits were placed in a wooden incubator. The air in this incubator was heated by electricity and the cable of an "Inductotherm" was wound around the outside of the incubator. This placed the subject within the electromagnetic field of the "Inductotherm" (fig. 1). The other group was placed in a similar cabinet with the head pro-

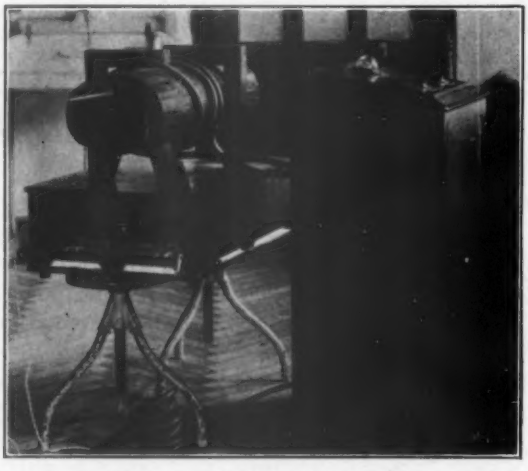

Fig. 1. — Wooden incubator and high frequency apparatus for aerotherapy and inductotherapy. The rabbit is completely enclosed in the incubator, and the loops of the short wave cable are wound around it.

jecting from the heated air chamber. The air within was kept in constant movement by means of an electric fan (fig. 2). The cable of the "Inductotherm" was placed under the litter of the incubator. This arrangement was identical with that used in clinical physicopyrexia. Three treatments were given with an interval of from three to eight days between treatments. Temperatures of 42 C. were attained lasting from one-half to one hour and 41 C. lasting two hours.

The rabbits of the third group were treated with combined physicopyrexia and chemotherapy. In some the fever treatment was given on the same day; in others, on the day following the salvarsan injection. Some animals died from heat stroke; others died from accidental causes (table 1). All clinical lesions of syphilis disappeared rapidly. No further symptoms were observed even after many months. In all, 92 rabbits had survived treatment. The question then arose: "Which rabbits had actually been completely cured?"

It is well known that rabbit syphilis cannot be cured spontaneously To prove this, popliteal lymph nodes of an infected rabbit (age is not im-

portant) are transplanted into the testicles of a healthy rabbit. The same method may be used to check healing after treatment. However, a negative result in this case does not signify that syphilis is not present, because the germ may have been eliminated from the lymph nodes and yet may persist elsewhere. Therefore, the transplant must not be made until sufficient time

Fig. 2. — Wooden incubator and high frequency apparatus for aerotherapy and inductotherapy. The head of the rabbit emerges from the cabinet and the short wave cable runs under the litters.

TABLE 1. — *Synopsis of Results on All Rabbits Treated.*

Method of Treatment	Animals Treated	Animals Lost by			Surviving Animals Used for Evaluating Efficiency of Treatment								
					Ganglion Transplants Emulsion of Organs			Ganglion Transplants Reinoculation			Summary		
		Heat Stroke	Accident or Control Animal Death	Total	Not Cured	Cured	Total	Not Cured	Cured	Total	Not Cured	Cured	Total
Salvarsan therapy only	16	0	2	2	6	3	9	3	2	5	9	5	14
Physicopyrexia only	78	19	15	34	11	5	16	20	8	28	31	13	44
Salvarsan therapy combined with physicopyrexia	60	15	11	26	1	15	16	8	10	18	9	25	34
Totals	154	34	28	62	18	23	41	31	20	51	49	43	92

has elapsed to allow the Treponema to reinvade the lymphatic system. In case of failure, asymptomatic syphilis must be eliminated in the control rabbit. Even then it is still possible for the infection to remain latent and for a reinfection of the lymph nodes not to occur. In short, negative results of lymph node transplants are not always certain proof that a cure has been effected.

A second good criterion consists of transplanting an emulsion made from various organs. Failure of such a transplant does not necessarily provide positive proof of cure, since the inoculated mass is necessarily limited.

Finally, one may be guided by the success or failure of the reinoculation of an animal with a homologous strain of Treponema. It has been ascertained that if an animal is clinically healed by means of chemotherapy, a

reinoculation is, with few exceptions, followed by a reappearance of a syphiloma. This is also interlinked with the question of the thoroughness of the treatment and the time that has elapsed since the animal was cured. Some think that the failure of reinoculation means immunity to the infection (premunity); others think that a true postimmunity is demonstrated. Be this as it may, a reinfection points strongly toward the disappearance of the former infection. One may thus conclude that one is not far from the ultimate truth if it is assumed that rabbits which can be reinfected have been healed.

The tests were carried on as follows: Let it be assumed, as shown in figure 3, that *X* rabbits were treated. The problem was to determine whether

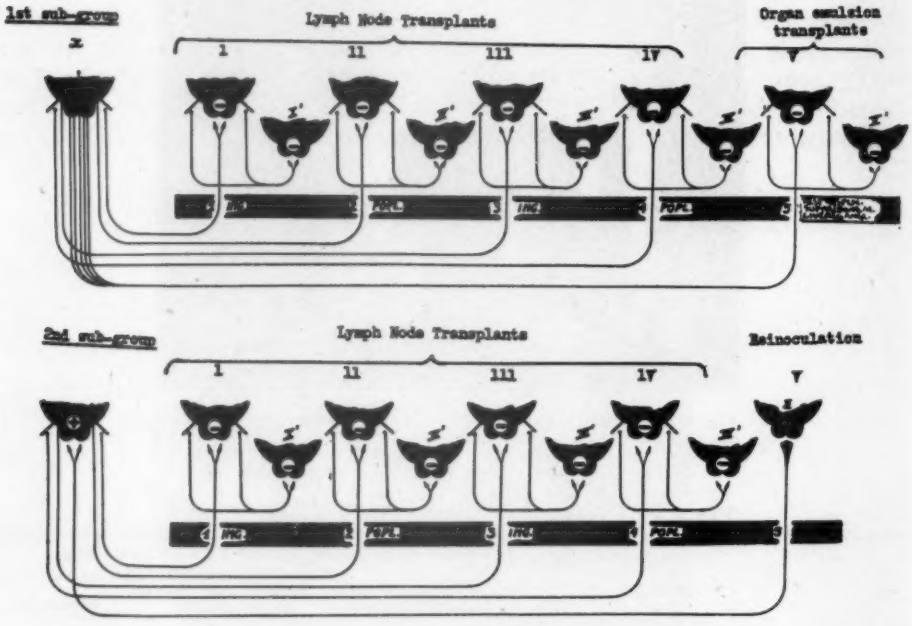

Fig. 3. — Criteria of cures.

or not the infection had completely disappeared. The group was divided into three subgroups. The inguinal and popliteal nodes, the testicles, the adrenals, liver, spleen, bone marrow and other lmyph nodes were removed from the first subgroup. This was done at various time intervals covering several months. Each of these tissues and an emulsion of the organs mentioned were transplanted individually into the testicles of normal rabbits. In those cases in which there was no reaction after several months (controls I to V) their popliteal glands were transplanted a second time to other normal rabbits. Thus if a rabbit from group "*X*" was completely cured of syphilis, the rabbits I to V and the animals in group I′ to V′ must not show the least sign or symptom of syphilis.

In the second subgroup of rabbits the inguinal and popliteal nodes were transplanted and the same secondary transplant checks were employed as in the first subgroup. Then the rabbit from subgroup *X* was reinoculated intratesticularly with the same strain of Treponema. Now if the animal was completely cured, not only would its controls I to IV and I′ to IV′ remain normal, but, in addition, the animal would react by development of the testicular syphiloma.

We think that this technic merits confidence. Of course, it takes a great deal of time and requires a large number of rabbits. We have been able

to carry on this complicated procedure through the generosity of the Josiah Macy, Jr., Foundation of New York.

The types of reaction (table 2 and fig. 4) should now be considered. At

TABLE 2. — *Types of Biologic Tests of Recovery.*

Types	Transplants: Ganglion 1st	Transplants: Ganglion 2nd & 3rd	Transplants: Organ Emulsion	Transplants: Reinoculation	Number of Animals Treated: Biologic Cures	Salvarsan Only	Pyrexia Only	Combined Treatment
A1	Positive	.....	Positive	.....	.....	2	2	0
A2	Positive	.....	.....	Negative	.....	1	2	0
A3	Positive	Positive	.....	Negative	.....	0	3	0
B1	Negative	.....	Positive	.....	.....	2	5	1
B2	Negative	Negative	Positive	.....	.....	1	2	0
B3	Negative	Positive	Positive	.....	.....	1	1	0
B4	Negative	Positive	Positive	Negative	.....	0	3	1
B5	Negative	.....	Positive	Negative	.....	1	7	4
B6	Negative	Negative	Positive	Negative	.....	1	3	3
C1	Positive	Negative	Positive	.....	.....	0	1	0
C2	Positive	Negative	.....	Negative	.....	0	2	0
D1	Negative	Negative	Negative	.....	Yes	3	2	3
D2	Negative	Negative	Negative	.....	Yes	0	1	11
D3	Negative	.....	.....	Positive	Yes	0	4	6
D4	Negative	Negative	.....	Positive	Yes	2	2	4
E1	Positive	.....	Negative	.....	Yes	0	2	1
E2	Positive	Negative	.....	Positive	Yes	0	2	0

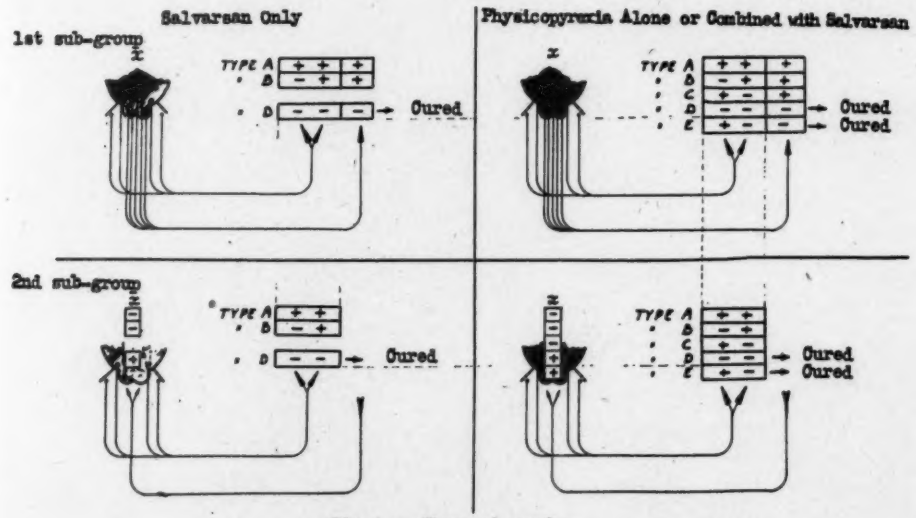

Fig. 4. — Types of reactions.

times, in the case of rabbits treated with salvarsan or with physicopyrexia alone, all the transplants produced syphiloma and the clinical effect of the reinoculation was nil. In these cases (type A, 3 variants), the persistence of the disease was evident.

In other rabbits taken from the three treated groups, the first lymph node transplant was negative, as were later secondary transplants. However, an emulsion of various organs produced specific lesions or the rabbit was found refractory to reinoculation. In this second series of cases (type B, 6 variants), the treatment produced only a partial and temporary sterilization. In other words, not all organs had been freed of their treponema.

Type C (2 variants) was observed in 3 rabbits which had been treated with physicopyrexia alone. The positive result of the first transplant re-

TABLE 3. — *Partial Summary of the Results of Treatments.*

Method of Treatment	Types	CLINICAL STATE AT START OF TREATMENT: Time Elapsed Since Experimental Infection	CLINICAL STATE AT START OF TREATMENT: Presence of Lesions	SALVARSAN THERAPY: Dose Per Kilogram of Animal Weight	SALVARSAN THERAPY: Intervals Bet. Injections (by Day)	PHYSICOPYREXIA: Treatments: Number	PHYSICOPYREXIA: Treatments: Time Interval	PHYSICOPYREXIA: Ave. Rectal Temp. C°: Duration	PHYSICOPYREXIA: Ave. Rectal Temp. C°: Temperature	TRANSPLANTS: Lymph Node: Time Elapsed Since Treatment	TRANSPLANTS: Lymph Node: Results	TRANSPLANTS: Emulsion of Organs: Time Elapsed Since Treatment	TRANSPLANTS: Emulsion of Organs: Results	REINOCULATION: Time Elapsed Since Treatment	REINOCULATION: Results	REINOCULATION: Cures
ONLY SALVARSAN THERAPY	A1	4 mos.	.....	3x¼ cc.	8	....	.....	.....	.....	2 mos.	Pos.	12 mos.	Pos.	.....	.....	.....
	A2	4 mos.	.....	3x¼ cc.	8	....	.....	.....	.....	3 mos.	Pos.	.....	.....	12 mos.	Neg.	.....
	B1	8 mos.	.....	3x½ cc.	3	....	.....	.....	.....	5 mos.	Neg.	12 mos.	Pos.	.....	.....	.....
	B2	3 mos.	TS	3x½ cc.	8	....	.....	.....	.....	4 mos.	Neg.	.....	.....	.....	.....	.....
										6 mos.	N.(cR)	10 mos.	Pos.	.....	.....	.....
	B3	3 mos.	K	3x½ cc.	3	....	.....	.....	.....	3 mos.	Neg.	.....	.....	.....	.....	.....
										6 mos.	Pos.	10 mos.	Pos.	.....	.....	.....
	B5	9 mos.	.....	3x½ cc.	8	....	.....	.....	.....	7 mos.	Neg.	.....	.....	12 mos.	Neg.	.....
	B6	4 mos.	.....	3x¼ cc.	8	....	.....	.....	.....	3 mos.	Neg.	.....	.....	.....	.....	.....
										6 mos.	Neg.	.....	.....	12 mos.	Neg.	.....
	D1	3 mos.	K	3x½ cc.	8	....	.....	.....	.....	6 mos.	Neg.	10 mos.	Neg.	.....	.....	Yes
	D4	3 mos.	TS	3x½ cc.	3	....	.....	.....	.....	2 mos.	Neg.	.....	.....	.....	.....	.....
										6 mos.	Neg.	.....	.....	9 mos.	Pos.	Yes
PHYSICOPYREXIA	A1	6 mos.	.....	.....	....	3	3 days	1 hour	42.0	Immed.	Pos.	12 mos.	Pos.	.....	.....	.....
	A2	7 mos.	.....	.....	....	3	3 days	1 hour	42.1	6 mos.	Pos.	.....	.....	9 mos.	Neg.	.....
	A3	16 mos.	.....	.....	....	3	8 days	1 hour	42.2	3 mos.	Pos.	.....	.....	.....	.....	.....
										9 mos.	Pos.	.....	.....	9 mos.	Neg.	.....
	B1	8 mos.	.....	.....	....	3	3 days	1 hour	42.0	3 mos.	Neg.	5 mos.	Pos.	.....	.....	.....
	B2	7 mos.	.....	.....	....	3	3 days	1 hour	42.1	40 days.	Neg.	.....	.....	.....	.....	.....
										5 mos.	Neg.	9 mos.	Pos.	.....	.....	.....
	B3	6 mos.	.....	.....	....	3	8 days	30 min.	42.4	3 mos.	Neg.	.....	.....	.....	.....	.....
										6 mos.	Pos.	9 mos.	Pos.	.....	.....	.....
	B4	3 mos.	TS	.....	....	3	8 days	1 hour	42.0	3 mos.	Neg.	.....	.....	.....	.....	.....
										5 mos.	Pos.	.....	.....	7 mos.	Neg.	.....

	B5	7 mos.	.....	.....	....	3	8 days	1 hour	42.2	2 mos.	Neg.	.....	.....	8 mos.	Neg.	.....
	B6	11 mos	.....	.....	....	3	8 days	1 hour	42.0	4 mos.	Neg.	.....	.....	.....	.....	.....
										8 mos.	Neg.	.....	.....	.....	.....	.....
										10 mos.	Neg.	.....	.....	11 mos.	Neg.	.....
	C1	8 mos.	.....	.....	....	3	8 days	1 hour	42.0	5 days	Pos.	.....	.....	.....	.....	.....
										12 mos.	Neg.	.....	.....	.....	.....	.....
										15 mos.	Neg.	15 mos.	Pos.	.....	.....	.....
	C2	9 mos.	.....	.....	....	3	3 days	1 hour	41.1	10 days	Pos.	.....	.....	.....	.....	.....
										6 mos.	Neg.	.....	.....	6 mos.	Neg.	.....
	D1	3 mos.	TS	.....	....	3	8 days	1 hour	42.0	7 mos.	Neg.	12 mos.	Neg.	.....	.....	Yes
	D2	14 mos.	.....	.....	....	3	8 days	1 hour	42.5	4 mos.	Neg.	.....	.....	.....	.....	Yes
										14 mos.	Neg.	14 mos.	Neg.	.....	.....	.....
	D3	4 mos.	TS	.....	....	3	8 days	1 hour	42.3	15 days	Neg.	.....	.....	9 mos.	Pos.	Yes
	D4	6 mos.	.....	.....	....	3	3 days	1 hour	42.4	4 mos.	Neg.	.....	.....	.....	.....	Yes
										10 mos.	Neg.	.....	.....	10 mos.	Pos.	.....
	E1	6 mos.	.....	.....	....	3	3 days	1 hour	42.1	8 days	Pos.	10 mos.	Neg.	.....	.....	Yes
	E2	8 mos.	.....	.....	....	3	8 days	1 hour	42.9	10 days	Pos.	.....	.....	.....	.....	Yes
										7 mos.	Neg.	.....	.....	10 mos.	Pos.	.....
	B1	7 mos.	.....	3x¼ cc.	8	2	8 days	1 hour	40.8	Immed.	N.(cR)	9 mos.	Pos.	.....	.....	.....
	B4	8 mos.	.....	3x¼ cc.	8	3	8 days	30 min.	42.2	2 mos.	Neg.	.....	.....	.....	.....	.....
										9 mos.	Pos.	.....	.....	12 mos.	Neg.	.....
	B5	8 mos.	.....	3x¼ cc.	3	3	3 days	1 hour	41.8	1 mo.	Neg.	.....	.....	10 mos.	Neg.	.....
	B6	4 mos.	.....	3x¼ cc.	8	3	8 days	25 min.	42.4	11 days	Neg.	.....	.....	.....	.....	.....
										9 mos.	Neg.	.....	.....	12 mos.	Neg.	.....
	D1	3 mos.	K	3x¼ cc.	8	3	8 days	2 hours	41.0	2 days	N.(cR)	8 mos.	Neg.	.....	.....	Yes
	D2	6 mos.	.....	3x½ cc.	8	3	8 days	1 hour	42.2	3 mos.	Neg.	.....	.....	.....	.....	Yes
										6 mos.	Neg.	.....	.....	.....	.....	.....
										10 mos.	Neg.	10 mos.	Neg.	.....	.....	.....
	D3	8 mos.	.....	3x¼ cc.	3	3	3 days	1 hour	42.0	21 days	Neg.	.....	.....	9 mos.	Pos.	Yes
	D4	6 mos.	.....	3x½ cc.	8	3	8 days	1 hour	42.3	3 mos.	Neg.	.....	.....	.....	.....	Yes
										8 mos.	Neg.	.....	.....	.....	.....	.....
										10 mos.	N.(cR)	.....	.....	10 mos.	Pos.	.....
	E1	4 mos.	.....	3x¼ cc.	8	3	8 days	2 hours.	41.0	Immed.	Pos.	.....	.....	.....	.....	Yes
										2 mos.	Neg.	9 mos.	Neg.	.....	.....	.....

ONLY

COMBINED TREATMENT

KEY TO ABBREVIATIONS:
TS = Testicular Syphiloma. K = Inoculated Keratitis. Immed. = Immediately. Min. = minutes. cc = cubic centimeter. Pos. = Positive. Neg. = Negative. N.(cR) = Negative confirmed by Reinfection, i. e., by the appearance of a syphiloma resulting from reinoculation.

inforced by the positive result of the injection of an organ emulsion or by the negative reaction of an intratesticular reinoculation and the simultaneous negative result of the intermediate transfers would seem to be the result of stimulation of the defensive mechanism of the organism by physicopyrexia. A defensive force sufficient for the destruction of a large number of germs is mobilized yet this is insufficient to produce a true biological cure.

In the fourth series of animals (type D, 4 variants), not one transplant was positive and reinoculation produced syphiloma. This type was found among all subgroups. It indicates a total eradication of the disease.

Finally, in some rabbits treated only with physicopyrexia as well as others treated by the combined method, the first lymph nodes transplants were positive while the later transplants were negative. In addition, the organ emulsion proved sterile and the reinoculation provoked testicular lesions. This type E (2 variants) differed from type C in that the syphilitic infection resisted the immediate action of treatment but soon yielded to the increased defenses of the organism produced by hyperthermia. This increase was sufficient, alone or in combination with the treponemocidal action of salvarsan, to overcome the last germ. Table 3 is a partial survey of these experimental data.

Each group of rabbits treated as indicated shows definite types of reaction. The cases of type B are similar to those of Worms and of Prigge. The initial phenomenon of types C and E is identical with that which I have already described in connection with local antisyphilitic thermotherapy of the lymph nodes. The percentage of cures based on the results of transplants alone and those dated on gland transplants plus reinoculation amount rspectively (table 1) to 23 of a total of 41, or 56 per cent, and to 20 of a total of 51, or 39 per cent.

According to these data, local homologous reinoculation with reinfection proves that the first infection has disappeared as a result of treatment. It also confirms the fact that if all three criteria previously cited are employed, the true extent of recovery can be evaluated.

In the light of these principles what was the efficacy of the three methods of treatment? By the use of salvarsan therapy alone (fig. 5) 25 per cent of cures were obtained in early syphilis and 60 per cent in late syphilis, or an average of 44 per cent. These results were obtained from animals which had received three treatments of 0.5 cc. of salvarsan at three or eight day intervals.

The same graph (fig. 5) is copied in figure 6, where it may be compared with the results obtained by physicopyrexia alone. The latter treatment was successful only after three hyperthermic treatments of one hour each at intervals from three to eight days had been given. Moreover, the percentage of cures was not very high: 27 per cent syphilis and 54 per cent in early syphilis, or an average of 37 per cent. This is due to the fact that, first, the Treponema located in lymph glands of the body have a high thermoresistance; second, that the lethal temperature of Treponama pallidum in external lesions, 42 C. maintained for one hour, was not reached in all experimental animals. This is apparent (fig. 7) from the thermoelectric measurements of various tissues of normal rabbits under treatment. The rectal temperature illustrated by straight line no. 1 rose during physicopyrexia from about 39 C. to over 42 C. Most of the other curves were irregularly lower. Numerous other similar measurements were made on rabbits and human beings. The curves obtained are reported in other articles.

TABLE 4. — *Rabbits Probably Not Cured Despite Combined Treatment.*

Stage of Infection	Number of Rabbits	Solusalvarsan (Doses per Kg. of Animal Weight)	Physicopyrexia Treatments		Average Rectal Temperature	
			Number	Time Interval, Days	Duration	Degrees C.
Early syphilis	63	3 doses of 0.25 cc.	3	8	25 min.	42.4
	65	3 doses of 0.25 cc.	3	8	1 hour	41.8
	72	3 doses of 0.5 cc.	2	8	1 hour	42.0
Late syphilis	76	3 doses of 0.25 cc.	3	8	1 hour	41.7
	78	3 doses of 0.5 cc.	3	8	1 hour	41.8
	82	3 doses of 0.25 cc.	2	8	1 hour	40.8
	83	3 doses of 0.25 cc.	2	3	1 hour	41.9
	85	3 doses of 0.25 cc.	3	8	30 min.	42.2
	89	3 doses of 0.25 cc.	3	3	1 hour	41.8

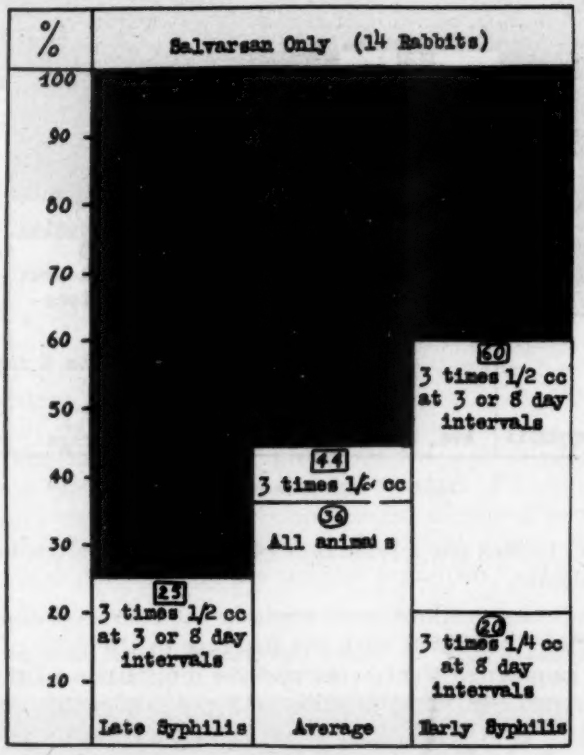

Fig. 5. — Results: percentage of cures.

The results of all three methods are compared in figure 8. The percentage of cures produced by salvarsan therapy combined with physicopyrexia is shown at the extreme right. Only those rabbits that had received at intervals of three or eight days three salvarsan treatments of 0.5 cc. of the solution plus three hyperthermic treatments of one hour each were taken into account. When this type of treatment was used in the early and late stages of the disease, 83 of 100 animals recovered. This is an average of 90 per cent. This favorable outcome is especially striking in the case of syphilis. In that stage of the disease the combined treatment is much more efficacious than either salvarsan therapy and physiocopyrexia taken together or separately.

All in all, 9 rabbits were not cured by combined treatment. In all of these either the salvarsan therapy or the physicopyrexia was inadequate. Table 4 reviews these cases. Inadequacies are underlined. A careful perusal

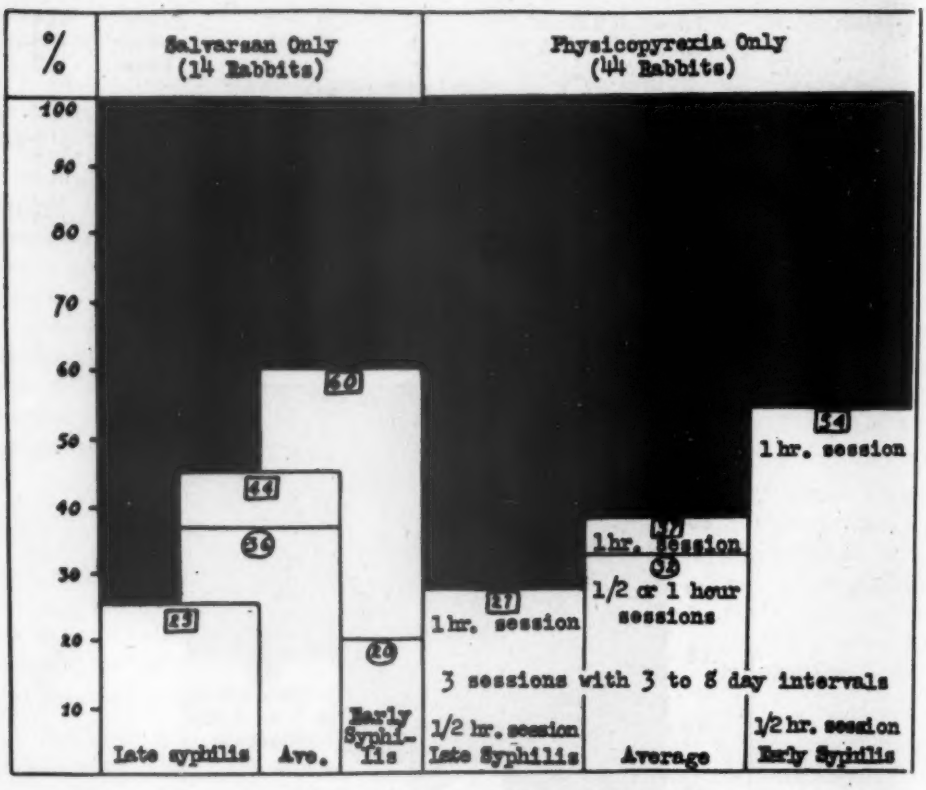

Fig. 6. — Results: percentage of cures.

of these results clarifies the advantages of adequate combined therapy in the treatment of syphilis.

Several other observations were made in the course of experiments. The percentage of cures increased with the increase of the dose of salvarsan, the increase in the number of treatments and the diminution of the time interval between treatments. In early syphilis, the percentage of cures was higher after salvarsan treatment in those animals with keratitis than in those in which syphiloma had developed. The reverse was true after treatment with physicopyrexia alone and after combined treatment. This demonstrates that the treponemal infection was very intense after testicular inoculation and that the cornea had participated in the general hypertherapy to only a small extent.

The temperatures attained reached the limit of tolerance of the animals. The lesions observed were analogous to those reported by Hartman and by Giles and his collaborators. We agree with the observations of these men as well as those of Jacobson and Parker, that hyperthermia does not influence the sexual ardor of animals. At times the power of reproduction did not manifest itself during a four month period. It must be noted that this reaction is not manifested in man. He bears up well under physicopyrexia.

Salvarsan therapy alone as well as the combined treatment rapidly suppressed the virulence of the blood. Physicopyrexia alone did not always

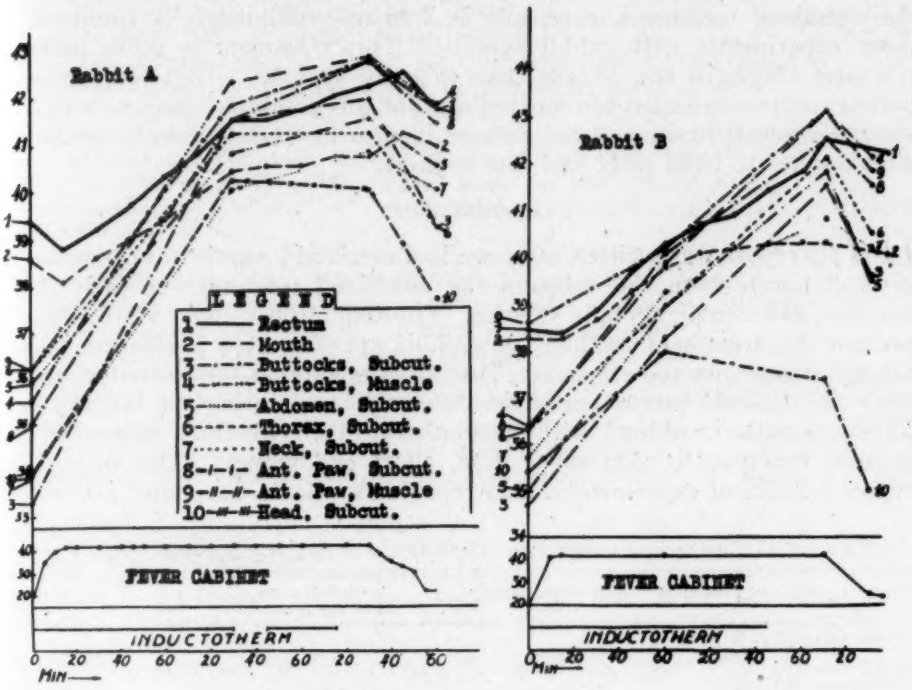

Fig. 7. — Temperature curves.

succeed in doing this. The Wassermann and the Kahn reactions were influenced irregularly. However, it is known that these tests are not specific in rabbits, even if a technic is used which gives excellent results in man.

Our conclusions are as follows: If one treats the syphilitic rabbit with adequate doses of salvarsan and adequate physicopyrexia, a high percentage of biologic healing takes place. If the same doses of salvarsan or physicopyrexia are used separately, a very low percentage of complete healing ensues. Apart from the immediate treponemicidal action of heat on the germs of external lesions, the beneficent effect of physicopyrexia is due to a stimulation of the natural defenses of the animal organism. The superiority of

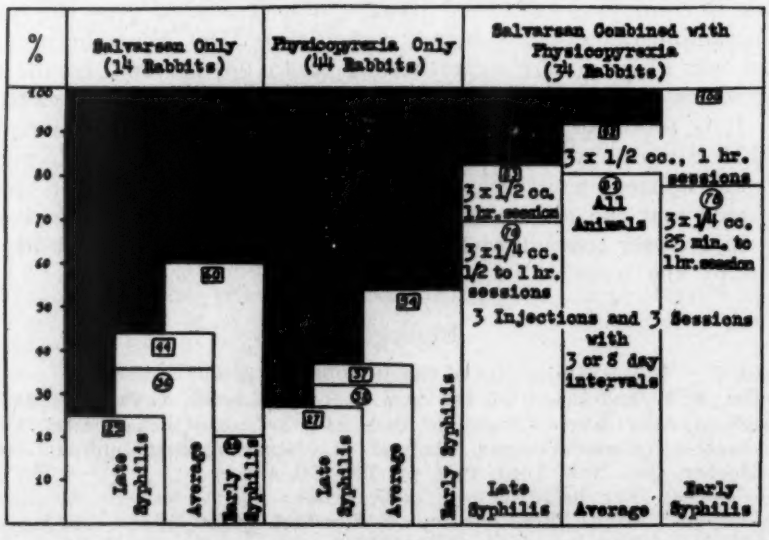
%
Salvarsan Only (14 Rabbits)
Physicopyrexia Only (44 Rabbits)
Salvarsan Combined with Physicopyrexia (34 Rabbits)
3 x 1/2 cc., 1 hr. sessions
3 x 1/2 cc. 1 hr. session
All Animals
3 x 1/4 cc. 25 min. to 1 hr. session
3 x 1/4 cc. 1/2 to 1 hr. sessions
3 Injections and 3 Sessions with 3 or 5 day intervals
Late Syphilis
Average
Early Syphilis

Fig. 8. — Percentage of cures.

the combined treatment, especially in human syphilology, is confirmed by these experiments with rabbit syphilis. This treatment is more potent in the later stages of the disease than in early syphilis. Therefore, good experimental reasons exist for concluding that this combined therapy will bring about an actual healing of the disease in man instead of merely masking it. This applies to both early and late syphilis.

Addendum

This report was written after we had received a reprint by Simpson and his collaborators on the value of the combined treatment of early, latent, nervous and ocular syphilis in man. Quoting Moore, who stated that the present day treatment methods of syphilis are still, "too prolonged, to painful, too dangerous, too expensive," the authors express their satisfaction that, after the clinical observation of thousands of cases during the last ten years, physicopyrexia combined with chemotherapy proved more successful than malaria therapy. It also saves time, effort and money. The authors also report a series of experimental data reported by Boak, Carpenter and Warren

TABLE 5. — *Comparison of the Percentage of Cures in Early Syphilis of the Rabbit.*

Without Treatment	With Physicopyrexia Alone	With Salvarsan Therapy Alone	With Combined Treatment
Boak, Carpenter & Warren:			
0%	10%	33%	75, 95 or 100%
Bessemans & Denoo:			
0%	54%	60%	100%

at a meeting of the Public Health Association. We have not read the original paper; however, Simpson's report has enabled us to draw the accompanying comparative table (table 5).

Boak and his associates studied only early syphilis. Their animals were killed too soon, and their healing tests were imperfect. Yet their results confirm ours, and vice versa. Our percentages of cures are higher because our animals reached higher temperatures and because before each treatment we gave doses of neosalvarsan, whose clinical efficacy is recognized. The interest in the data of our colleagues lies in the fact that they were obtained from a great number of rabbits and that they also establish the fact that when one is employing combined treatment it is best to give the injections of arsphenamine immediately before rather than after hyperthermy. When salvarsan was given before hyperthermia 95 to 100 per cent of the animals were cured, as against only 75 per cent when salvarsan was injected afterward. It is probable that the increase of its curative effect is really that assumed by Simpson and his collaborators, i. e., acceleration by hyperthermy not only of the treponemicidal power of salvarsan but also of the circulation of the blood and the dilatation of the capillaries. Thus the salvarsan is brought into closer contact with the Treponema, whose vulnerability is also increased by the increase in body temperature.

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A SPECIAL KNEE BRACE *

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A problem which confronts every physician in the treatment of leg disabilities is the prevention and correction of flexion deformities of the knee. Whatever gains are made in increasing the range of motion at the knee are usually lost between treatments when the patient sits in a wheelchair or rests in bed with the knee flexed. In order to prevent such loss and to maintain and even increase the range of motion between treatments, use of a brace of the following type is recommended:

The brace consists of two duralumin bars 12 inches long with posterior cuffs 4 inches wide attached to the bars with a single rivet which allows some movement in the cuffs. The cuffs are covered with leather and padded on the inside. The size of the thigh and calf cuffs varies with the width and circumference of the patient's lower extremity. In order to meet the needs of the patients who require such an appliance, it is essential to have in the department a number of these braces with various sizes of cuffs.

In order to correct a flexion deformity of the knee the brace is placed over the posterior part of the limb and held in place by a six-strap knee cap (figure). The tension can be regulated by the six straps which encircle the

vertical bars. My colleagues and I have found these braces useful in the treatment of contractures, spasms and tight capsular ligaments which often result from fractures, amputations and spastic paralysis as a result of brain and spinal cord lesions.

The brace has also been found useful as a support for weak quadriceps muscles. Many patients who have a disuse atrophy from long periods of bed rest can be made ambulatory, in the walker or on crutches, with the aid of these knee braces, while increasing the strength of the quadriceps muscle by special exercises.

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* From Bellevue Hospital, New York.

COMMUNITY HOSPITALS AS CIVILIAN REHABILITATION CENTERS *

As previously has been pointed out, the field of medicine is in a process of rapid development. To the older concept of curative medicine, including surgery, have been added the tremendously important field of preventive medicine and the field of restorative medicine, which is still in its infancy. Until recently the hospital considered its work for the bed patient was completed when he was discharged and was able to go home. The work of restoring him to health and vigor was left to Nature and his family physician. In recent years, hospitals have recognized the need for special equipment and technics to restore discharged patients to health and normal body functions. Particularly is this true of discharged surgical patients. However, many hospitals have been slow to recognize their community responsibilities in this field of restorative medicine. If they have established physical therapy departments, they have, in most cases, treated them as stepchildren, handicapped by inadequate facilities and personnel. As yet the medical schools have not clearly recognized the very great potentialities inherent in physical medicine. It was not until Mr. Bernard M. Baruch contributed large sums to stimulate the development of physical medicine and, in April, 1944, established the Baruch Committee on Physical Medicine that rapid progress has been made in the development of this field. Dr. Frank H. Krusen, head of the Department of Physical Medicine of the Mayo Clinic and Director of the Baruch Committee on Physical Medicine, has defined physical medicine as follows:

"Physical medicine includes the employment of the physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices for physical and occupational therapy in the treatment of disease. * * *

"Physical medicine is the more generic and more inclusive term and as defined herewith it embraces physical therapy, occupational therapy and the employment of physical agents for diagnostic purposes." [44]

The physical agents include electronics, hydrology, climatology, manipulative procedures and physical rehabilitation. Because of the fact that most of the work in physical medicine falls within the purview of the ambulatory clinic, this Report would be incomplete if it did not give attention to this very important field.

The Baruch Committee has made grants, aggregating $1,080,000 over varying periods of time as long as ten years to leading medical schools to finance various projects for the development of physical medicine,[45] Another important phase of that committee's work consists of aiding various medical schools to train qualified physical therapists and other technicians required in the progressive development of this field. The development of physical medicine will be both rapid and substantial, and close attention should be given by the hospitals of Pennsylvania to the continued betterment of their clinic work in this field.

It is not necessary for the hospitals to await the fruits of the research work above mentioned. The development of physical medicine in the hos-

* Chap. 6, from "Better Hospital Care for the Ambulant Patient." Copyrighted by Hospital Association of Pennsylvania, reprinted with permission, Committee on Hospital Clinic Services of the Hospital Association of Pennsylvania.

44. The Future of Physical Medicine, with special reference to the recommendations of the Baruch Committee on Physical Medicine, J. A. M. A. 125:1095 (Aug.) 1944.

45. Annual Report of the Baruch Committee on Physical Medicine for the Fiscal Year, April 1, 1944, to March 31, 1945, p. 30.

pitals of the United States has not kept pace with medical progress and the needs of the American people. The immediate establishment by the member hospitals of physical medicine departments, properly staffed and equipped, and the vigorous development of this work as a part of their clinic activities is strongly recommended. In support of this recommendation, attention is called to the following facts: (1) There were in the United States, prior to the beginning of World War II, twenty-three million persons handicapped to some extent by disease, accident, maladjustment, or former wars. There were some 350,000 individuals permanently disabled by accidents. (2) In 1940, we had some six and one-half million disabled males between the ages of 15 and 64 years—men who normally would be income-producing. (3) To this enormous total must be added the veterans who are disabled and will be handicapped subsequent to their discharge from military hospitals. Counting both groups, approximately eight million working-age males are disabled to the extent that they require physical or vocational rehabilitation or special placement aids in order to be successfully employed. *In other words, one person in sixteen of the general population, or one in seven of the male working population of the United States, is totally or partially disabled.*[46] Pennsylvania has a full measure of these handicapped and disabled people because of the important place which the industries of Pennsylvania occupy in the national picture and the fact that these injured persons, in part, are the by-product of industry.

According to Dr. Howard A. Rusk, former Chief of the Convalescent Services Division of the Office of Air Surgeon, there were approximately 17,000 amputations in the army during the first four years of World War II, but during this same period there were 120,000 major amputations from disease and accidents in our civilian population. There were 11,000 soldiers wounded on the beaches of Normandy during the first ten days after "D-Day," yet, in spite of curtailed automobile traffic, accidents in which automobiles were involved alone accounted for about twice that number of civilian casualties in the same ten days.[47]

To those totally unfit in consequence of industrial injuries must be added those who, for other reasons, were rejected for military service in the draft. Major General Louis B. Hershey, Director of the Selective Service System, testified before the Senate Subcommittee on Wartime Health and Education that, up to June 1, 1944, 4,108,000 draftees aged 18 through 37 had been rejected as unfit for military service, discarded from a pool of approximately 14,300,000. This makes the rejection rate nearly one out of every three men examined.[48]

The potentialities of civilian rehabilitation work, properly organized and conducted, are illustrated by the results achieved by the Office of Vocational Rehabilitation operating under the Federal Security Agency. Of the 43,997 persons undergoing vocational rehabilitation under this Agency in 1944, 22 per cent or more than 10,000 had never been gainfully employed, and nearly 90 per cent or approximately 40,000 were not employed at the time they started their rehabilitation. The average annual wage of the entire group prior to rehabilitation was $148. After rehabilitation the average annual wage of the group increased to $1,768. The total annual earnings of the entire group rose from $6,510,556 to $77,786,696. Prior to rehabilitation the majority of these persons relied on general public assistance, not only for the disabled individual but also for his family. The *annual* cost of this as-

46. Hope for Our Disabled Millions. Howard A. Rusk. New York *Times* Magazine 95:10 (Jan. 27) 1946.

47. Ibid. [See also A Community Rehabilitation Service and Center (Functional Plan). The Baruch Committee on Physical Medicine, pp. 4, 5.]

48. Hearings. Wartime Health and Education, (supra), p. 1617.

sistance to the taxpayers was from $300 to $500 per case. The *total* cost of the rehabilitation of the major part of this group averaged only $300 per case.[49]

Prior to the extreme labor shortages which existed in many industries during World War II, many large employers would not hire physically handicapped persons. It is authoritatively stated[50] that during the War 83 per cent of the nation's industries employed handicapped persons. These industries, in reporting their experience with the handicapped, agree that there was a much smaller labor turnover, less absenteeism, fewer accidents and, on the whole, equal or higher production rates. Some large industries—as, for example, the Ford Motor Company's River Rouge plant, which has employed as many as 1,000 handicapped civilian workers—regard the handicapped as a permanent part of their labor personnel.

Many industries are now making careful scientific studies to determine how many occupations can be satisfactorily performed by handicapped persons. The Westinghouse Electric Corporation's studies, for example, disclose that approximately 19 per cent of the type of work done in their plants could be performed satisfactorily by persons having only one leg; 17 per cent by operators who must use crutches; 83 per cent by men with only one eye and 82 per cent by the deaf.[51]

As the Baruch Committee has said:

"The goal of rehabilitation is to achieve the maximal function of the individual and to prepare him physically, mentally, socially, and vocationally for the fullest possible life compatible with his abilities and disabilities." * * *[52]

"It has been estimated by experts in the field of rehabilitation and re-training that up to 97 per cent of all handicapped persons can be rehabilitated to the extent of gainful employment. Comprehensive rehabilitation is the third phase of medical care which, by an integrated program of physical rehabilitation, psycho-social treatment and adjustment, and vocational re-training, takes the man from the bed to the job."[53]

The Committee is convinced that a substantial proportion of the disabled and handicapped could be rehabilitated by the application of procedures and technics which have been evolved, without regard to the new procedures and technics which shortly will be available as a result of the research which the Baruch Committee is financing.

It is, therefore, strongly recommended that the voluntary general hospitals each should carefully and sympathetically study the establishment of a Civilian Rehabilitation Center as a part of the enlarged activities of the hospital. The Civilian Rehabilitation Center is an essential and important part of the work of a Medical Center, constituting in large measure the third part of the work of the modern community hospital, viz., the rehabilitation of the patient after his discharge from the hospital.

In this connection we reproduce, with approval, the opinions and recommendation of the Subcommittee on Civilian Rehabilitation Centers whch have been approved and promulgated by the Baruch Committee on Physical Medicine:

I. Civilian Rehabilitation Service and Center:

1. There is a crying need for a community rehabilitation service and center program. Large, highly specialized urban rehabilitation centers are necessary but are not enough, and, in order to carry opportunity to the isolated disabled, a system of mobile consultant clinics, in rural communities, and similar services must be set up,

49. Annual Report of the Baruch Committee, etc., (supra), pp. 75-76.
50. Rusk. New York *Times* Magazine, (supra). [See also Baruch Committee, A Community Rehabilitation Service and Center (supra, Ref. 47)].
51. Ibid.
52. Summary of Proceedings of the Subcommittee on Civilian Rehabilitation Centers. Baruch Committee on Physical Medicine. June 23, 1945, (mimeographed sheet, 3 pp.).
53. Baruch Committee. A Community Rehabilitation Service and Center, (supra, Ref. 47) p. 5.

comparable to those which have been utilized in the care of crippled children, in the cancer program, etc.

2. Certain activities can be carried on in smaller communities using the facilities that are available, but rehabilitation clinics, geographically located, must be established to carry out the specialized procedures that are necessary for the rehabilitation of the severely handicapped.

II. Rehabilitation and the Community:

Rehabilitation service and rehabilitation centers are community projects, and all of the existing facilities and organizations in the community must be fully utlized. The rehablitation center must be a part of the community rather than a thing within it. It is necessary to know what the community has to offer in terms of personnel and physical equipment. It must be a program of integration, and duplication should be avoided.

III. Objectives of Rehabilitation:

1. The objectives of a rehabilitation center are physical, mental, social and vocational adjustment, and after a period of medical, psycho-social and vocational evaluation, the individual must be fitted into an overall program destined to accomplish these objectives.

2. In the establishment of any rehabilitation project it must be realized that industry is the keystone in the whole structure because industry must take the finished product, and by careful and selective placement, utilize these individuals within their capabilities. Labor must understand that the third phase of medical care—rehabilitation—is a service and right that must be made available to all citizens in a democracy and that they have a right to expect such opportunities. The medical profession, governmental and social agencies, insurance companies, and individuals must be made cognizant of the opportunities available in a comprehensive, well-rounded program of rehabilitation and that with such a program, many handicapped individuals may be transformed from dependent invalids into contributing, self-respecting, self-supporting citizens.

IV. Educational Program:

A comprehensive educational program, both professional and civilian, is necessary to the successful prosecution of any rehabilitation service. *Professional*: To acquaint physicians, nurses, social workers, physical therapists, occupational therapists, physical educators, vocational guidance counselors, psychologists, educators, and all other interested scientific groups with the principles, procedures, and results in rehabilitation by:

(a) Comprehensive courses in rehabilitation (graduate and postgraduate) for physicians, students of medicine, and its allied professions, including hospital administrators and executives.

(b) Clinics and demonstrations.

(c) Scientific publications and scientific exhibits.

Civilian (*Community Education*): To acquaint the individual with advancements, possibilities, and what he has a right to expect from rehabilitation by:

(a) Constructve publications (fiction and non-fiction).

(b) Radio (educational programs and dramatizations).

(c) Motion pictures (special films and the injection of short scenes to show a phase of rehabilitation in the scenario of major films).

(d) Industrial publications, trade journals, and similar publications, which can be used as a medium to reach industry.

(e) Labor journals and periodicals to reach, through the medium of national labor organizations, labor in all echelons.

(f) Scientific treatises on the productivity of the disabled in industry.

(g) Cooperation of national organizations * * * [Typical organizations are cited].[54]

We are impressed with the possibilities of the effective utilization by such a rehabilitation center of certain workshops in manual and vocational training schools, and of some of the teaching personnel engaged therein after they have been especially trained to handle intelligently, under medical

54. Summary of the Proceedings of the Subcommittee, (supra).

supervison, the re-traning work of certain classes of handicapped persons. We reproduce herewith, as an appendix, a graphic functional chart and organizational chart of a typical Rehabilitation Service and Center prepared by the Baruch Committee on Physical Medicine, to which the reader's attention is invited. It should, of course, be understood that smaller hopitals in sparsely settled areas should not endeavor to create a center of the size contemplated in these two exhibits. In such cases the scope of the project should be reduced to more modest proportions.

Such part of the equipment and facilities as can be provided by utilizing the workshops of nearby vocational schools should, of course, not be installed in a Rehabilitation Center. The remaining equipment and facilities, in the Committee's judgment, should be incorporated as a part of the plant of the Group Clinic, if such a clinic is organized, and operated in conjunction therewith for the care of both full-pay and Out-Patient Clinic patients of the hospital.

In consequence of enforced experiments during the War and increasing knowledge with respect to patient recovery and rehabilitation, it is now recognized that the one-time procedure of allowing patients to lie in bed for some days during convalescence, on the theory that the rest will promote their recovery, is fallacious in a large proportion of cases. Many hospital staffs have now veered in the direction of getting them out of bed as soon as possible, recognizing the tonic effect of this step upon the patient's mind and hence upon his recovery.

The Subcommittee on Civilian Rehabilitation of the Baruch Committee on Physical Medicine stresses the possibilities of revolutionary changes in hospital procedure, viz., to move patients out of the hospital into a convalescent wing as soon as they no longer need the special equipment and facilities contained in the hospital but not found in a convalescent section. The Subcommittee on Civilian Rehabilitation points out that such a wing can be built at a cost of approximately one-half of the cost per bed of the conventionally designed and constructed hospital and that, therefore, it will be possible, in most cases, with a very much smaller capital outlay, to expand the hospital's plant, to the extent required, by the construction of a convalescent wing rather than a new hospital wing of the conventional type of like capacity. In the construction of a convalescent wing, moreover, full advantage can be taken of the possibilities of making it more homelike and attractive in its design, furnishings and equipment than is possible in a hospital or in a hospital room. The Committee has made no extended study of this matter but commends it to the careful attention of hospital boards and administrators who are considering the expansion of their bed-plant. In view of the competence and wide experience of the distinguished physicians comprising the Baruch Subcommittee, which has proposed this step, and the apparent soundness of the underlying concept, the Committee believes that it warrants careful investigation by hospital medical staffs, administrators, hospital architects and consultants.

In May, 1946, the Baruch Committee published a pamphlet entitled "Report on a Community Rehabilitation Service and Center (Functional Plan)" designed to aid community hospitals, medical schools, civic groups, or other organizations interested in establishing community Rehabilitation Centers. The reader's attention is invited to a detailed floor plan for a Community Rehabilitation Service and Center having a capacity of 250 patients (50 dormitory patients and 200 out-patients), which was presented by the Baruch Committee, and which is reproduced as an appendix to this Report (their Chart No. 3).

Such a unit, it is stated, would be adequate to afford treatment to approximately 1500 patients annually, this figure being based upon an average length of treatment in the Rehabilitation Center estimated at sixty days, the average patient to be on a five-hour daily schedule. On this basis there would be an average of five new patients each day requiring medical, physical, psycho-social, and vocational examination and classification for placement in the rehabilitation program. Personnel requirements for the administrative staff, the medical services division, the vocational services division and the dormitory, aggregating approximately fifty-five individuals, are detailed. Specially designed and equipped shop units for use in the vocational training program provide for work in general crafts; general woodwork; general metal; business administration; graphic, fine and commercial arts; general radio and electricity, and general home economics. Each of these shops is designed to accommodate 20 persons at one time. The estimated total cost of providing the equipment of the seven shops named is stated to be approximately $13,500. A detailed, itemized list of equipment needed in each shop is included in the report.

The Baruch Committee's comments with respect to the operating costs of such a unit are here reproduced in full:

"In the planning of a community rehabilitation center, one of the first questions to be answered is, 'What will it cost to run?' This cost of operation is always more important than the initial cost of building, for the building cost is a single cost, the operating cost an annual one. "It is impossible to give information which is in any way exact on the operating costs of a community rehabilitation center. There are no statistics from similar institutions at the present time to use as a guide. However, it is believed that the cost of maintenance for the in-patients in this rehabilitation center should be comparable to the costs of crippled children's hospitals and convalescent homes. During the years 1937-1939, at which time operation costs were considered normal in most communities, this period being after the worst part of the depression and before the rise in prices and wages of the war period, the average per patient day cost for thirty crippled children's institutions in all sections of the United States was $2.79. Seven of the thirty were convalescent homes without definitive hospital facilities. These seven had an average per patient day cost of $2.27, or 20 per cent less. The minimum per patient day cost of these institutions was $1.19 per day and the maximum $4.80 per day. The number of patients per day in these institutions varied from 40 to 275, with an average of 96.

"In this postwar period of 1946, the cost of operation of these same hospitals and convalescent facilities is from 20 to 50 per cent greater than it was in the 1937-1939 period. This increase results in the average per patient day cost now being from $3.39 to $4.25. These figures are directly comparable to patient day costs in convalescent homes.

"In addition, for the whole center there would be the salaries of the administrative and professional personnel such as secretaries, academic and vocational teachers, psychologists, physical and occupational therapists, and the physicians.

"The cost of both salaries and supplies will vary with different sections of the country, and in the larger metropolitan areas the cost would be higher than in the smaller areas. However, the *average* salary of the Administration and Professional Staff should not be over $250 a month, and if a community wishes to start the rehabilitation center on a smaller scale and then enlarge as the demand increases, *this plan is entirely feasible.* In the beginning there will be many positions which can be filled by part-time employees or volunteer help. In fact, it is desirable that the center be started with a minimum of personnel and additions made as warranted.

"It is estimated that in a center caring for a patient load of 250 with an average stay of two months, which means 1500 patients each year, the average total unit cost for rehabilitation, exclusive of food service and domiciliary care, would be approximately $125 per patient. This cost includes physical therapy, occupational therapy, vocational testing, guidance and retraining, and psycho-social evaluation and treatment. This is the basic unit cost for rehabilitation and does not take into consideration construction cost, amortization or depreciation.

"From the patient source as outlined in the functional Chart No. 1,* it is obvious that a large percentage of patients in a rehabilitation center would be full or part pay

* Reproduced as Chart No. 1 in the Appendix to this Report.

patients. Those who pay the physician and are referred by him to the center for rehabilitation and retraining would be full or part fee patients. Those patients referred by the state vocational rehabilitation service would be fee patients. Fees for veterans referred for care would be paid by the Veterans Administration. Compensation cases referred by industry would be fee patients. From these patients sources it is obvious that a relatively large percentage of patients would be full or part fee patients.

"With good business administration and with the backing of the medical profession, government agencies, and insurance companies, the center should soon, in a large measure, be self-supporting and may only in the beginning need outside financial aid. The amount of such assistance, of course, will depend on the number of free patients and the size and scope of the research program." [55]

In order to determine the size of the Community Rehabilitation Service and Center which would initially be required, it is hereinafter suggested that a detailed inventory of physically handicapped persons in the tributary area should be made. The plans adopted for the initial construction of such a unit should be formulated with the probability in mind that at a later stage the expansion of the unit will be required, and it was with this thought in mind that the plan of the Baruch Committee above described, and which is shown on Chart No. 3 of the appendix, was formulated. Many hospitals initially should construct only a part of such a unit—in other words, a small center capable of subsequent expansion without extensive and costly changes.

Because of its direct and powerful appeal to the heart and conscience of the public, we are convinced that in those communities in which there are substantial numbers of handicapped people, a large amount of money can be secured from the public for the maintenance and operation of a Rehabilitation Center. In support of this belief, attention is called to the experience of the five small Rehabilitation Centers[56] in Connecticut, two in Bridgeport and one each in Hartford, New Haven and Stamford, the population of which cities in 1940 varied from 47,938 to 166,267. This rehabilitation project is operated under the sponsorship of the Connecticut Society for Crippled Children and Adults, which has financed its requirements by the sale of Easter Seals. Sales at the Easter Season in 1946 raised $150,000 —substantially enough to finance the Rehabilitation Center project for one year.

Additional evidence of the willingness of communities to support Rehabilitation Centers is furnished by the experience in Wilmington, Delaware, where a small center recently was established under the sponsorship of the Junior League, which estimated its operating deficits for the first year at $2,000. The Junior League put on a campaign in which over $6,000 was collected in the first six months!

It is strongly recommended that the voluntary hospitals, other than certain very small rural hospitals, should severally survey the rehabilitation requirements of the communities which they serve. So far as we are advised, the procedure of making such a survey is not contained in any published material. The obvious first step is a careful inventory, as nearly complete as possible, of the physically handicapped persons in the tributary area.

In making such an inventory we suggest that the hospitals enlist the active cooperation of the physicians in the tributary area, sending them a simple questionnaire, with explanatory notes, calling for the names, addresses, date of injury, if known, and type of disability and prognosis, with the request that they list thereon information with respect to all handicapped persons of whom they have knowledge in the area concerned. The State Board for Vocational Education and Rehabilitation also should be requested to furnish similar information, in so far as it has available data.

55. Baruch Committee. A Community Rehabilitation Service and Center, (supra), pp. 22-23.
56. Rehabilitation Work Increased by Baruch Fund. New York *Herald-Tribune*, June 2, 1946, p. 49.

The active assistance of such organizations as the administrative authorities of the public and sectarian schools, the Children's Aid Society, the local organization of the Society for Crippled Children, the Family Association, the local chapter of the National Foundation for Infantile Paralysis, the American Heart Association, the American Arthritis Association, the Association of Amputees, the Public Health Nursing Service, the Tuberculosis and Health Association, the American Legion, the Veterans of Foreign Wars, and other like agencies and organizations should be enlisted; their knowledge of the identity and location of the physically handicapped is invaluable, and their active cooperation in a comprehensive program for restorative care and re-education of such unfortunates should be enlisted at the outset of the program.

Among the data which should be collected in such a survey are the name and address, age and race of the patient, diagnosis of his infirmities, the amount of time which has elapsed since the injury or illness which handicapped him, the name of the family physician, and details concerning the treatment, if any, which each person has been receiving, together with the agencies interested in each patient. As much detailed information as can be secured should be recorded with respect to such matters as whether the patient or his or her family can pay for the treatment, including the medical fee; whether the family can provide transportation for the patient to and from the clinic, or whether domiciliary care will be required because of the condition of the patient, or the lack of transportation facilities.

From the foregoing data and other information of like character which should be collected, it will be possible to compile a preliminary and tentative estimate of the number of handicapped persons in the tributary area, classified to show the nature of the handicap, such as deformities from poliomyelitis and other sources of orthopedic disabilities, blindness, deafness and partial deafness, special defects, and cardiac ailments. The figures should be broken down to show in detail the number of persons who are without one or both hands or arms, who have lost one or both legs, etc., etc. In this survey particular effort should be made to determine which patients are homebound. For these the Baruch Committee plans that the Rehabilitation Center should provide through skilled personnel and adjunctive measures.

A comprehensive program should be worked out by the hospital and its medical staff with the community's various organizations, such as those previously mentioned, which are interested in the rehabilitation, training, and care of handicapped persons. These organizations can perform invaluable services not only in locating handicapped persons but in inducing them to visit the Civilian Rehabilitation Center, in affording transportation to and from the center of such patients as have no transportation facilities or whose condition is such that they require personal transportation; in assisting in the placement of handicapped persons in industry, after their training has been completed; in carrying back to their friends and neighbors throughout the entire territory the importance of a Rehabilitation Center and the results which are being achieved, and in raising such funds as are required to supplement patients' fees and other income to meet operating deficits. A properly equipped and efficiently staffed and operated Rehabilitation Center will command the support of the insurance companies which write workmen's compensation insurance and those which provide public

liability insurance to compensate for personal injuries by common carriers, private automobiles, etc.*

It should be obvious that such a survey, no matter how carefully made, will not completely inventory all of the handicapped persons in the tributary area. Many families are sensitive about their afflicted members, and the tendency frequently is to hide them away. The full measure of the handicapped load will not be apparent until an adequate and expertly staged Rehabilitation Center gets into operation and demonstrates to te community what it can do. When the Rehabilitation Center has won the confidence of the community through cures and marked improvement of the health of handicapped persons and has fitted them to pursue vocations to the fullest measure compatible with their abilities, then those who have escaped enumeration in the survey will come forward seeking the assistance of the Rehabilitation Center.

There is no form of activity which will more directly and convincingly carry the great value of restorative service which a modern hospital can perform than that of restoring to usefulness persons who have been seriously handicapped by some injury. The hospital can thus perform its function of bridging the gap "from the bed back to the job" and can restore to usefulness many people who otherwise would be unable to support themselves and would therefore become public charges.

* The Liberty Mutual Insurance Company, an extensive underwriter of workmen's compensation and public liability insurance, recently established a Rehabilitation Center in Boston to afford treatment to persons covered by its insurance policies who have been injured. A recent report to the Baruch Committee by this company shows that it is having marked success with from 65 to 70 per cent of the cases treated and anticipates being able progressively to increase this percentage as additional equipment is added and new technics introduced. The company advises that the operation of this center has materially reduced the period of disability and the consequent payments to insured persons treated in the center.

The Company furnished to the Committee the following analysis of 445 cases treated in this center up to June 7, 1946, which shows the following interesting facts:

Males treated 79%—average age 47.
Females treated 21%—average age 46.
Average time from injury or surgery to admission—7 months.
Average treatment period—49 days.

Results of Treatment	Per Cent
Returned to same work	36
Returned to different work	24
Able to work who discontinued their claims	3
Work status undetermined who settled their claims	5
Did not return to work	7
Work status remains undetermined	3
Treatment suspended	12
Referred for Surgery	9
Referred for Vocational Retraining	1
	100

AN IMPROVISED WHIRLPOOL

CAPTAIN LOUIS N. RUDIN

Medical Corps, Army of the United States

While leg and arm baths of the electrically driven turbine type are standard items of issue to general hospitals, the number is insufficient in many hospitals. To offset the whirlpool shortage, a continuous-flow whirlpool was developed by the author at the Crile General Hospital.

The apparatus consists of a Pump, filter, Richards, 7 inches long, with universal attachment (figure 1) (Med. Dept. Item 4383000). This is commonly

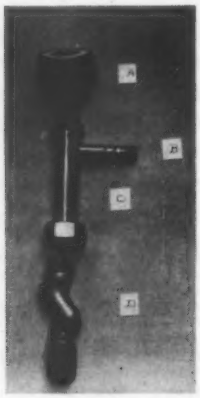


Fig. 1. — A, universal attachment; B, air intake valve; C, body of pump; D, water stream breaker.

known as the Buntzen suction pump and is used in medical laboratories to clean blood pipettes.

To convert this suction pump into a whirlpool mechanism, change the alignment of the pump from the vertical to a horizontal position in relation to the floor of the vessel. Extend air intake valve B (figure 2) above the water level of any vessel, using a galvanized iron, brass, or copper pipe. This should have a large enough bore to admit a screw driver to adjust air intake regulator, should an adjustment become necessary. A ½-inch, L-shaped, galvanized pipe connection is made between A and C. The zigzag-shaped copper pipe D breaks the stream of water and prevents splashing. E is an overflow pipe, draining into a sink—not essential if a common trough is used. A thermometer may be hung over the side of the tub to record the temperature of the water. While the model representd in figure 2 is especially suited for the upper extremity, the mechanism can be attached to a deeper vessel to accommodate the lower extremity. A whole battery of these whirlpools may be connected to a series of faucets from a single pipe of running hot water of proper temperature. The overflow from each bath may be allowed to drain into a common trough of the type used in washrooms of the semigarrison barracks.

This type of whirlpool is easily installed at any place where hot and cold running water is available. Electric current is not necessary. Little space

* Reprinted with permission, Bull. U. S. Army Med. Dept. 6:87 (July) 1946.

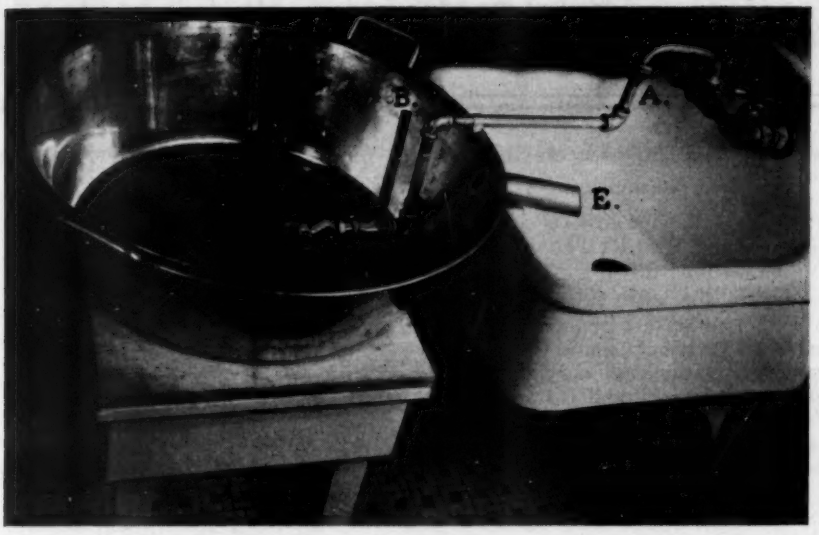


Fig. 2. — Suction pump fitted to a basin and connected to a source of hot and cold water, making a whirlpool bath.

is required. A small room or a ward may accommodate from fifteen to twenty patients at one time. It conforms to the standards for home-made whirlpools of the Council on Physical Medicine of the American Medical Association.

MEDICAL NEWS

Careers for Medical Officers in Physical Medicine

(Ed. Note: The following article is printed with permission of THE BULLETIN of the U. S. Army Medical Department.)

The opportunity to specialize in physical medicine offers to medical officers prospects for a very gratifying career. The purely medical aspects of physical therapy, occupational therapy, and physical reconditioning are being stabilized as a physical medicine service. The non-medical aspects of reconditioning will be administered under a proposed convalescent services division. In general hospitals the physical medicine service will be a major service on a level with the medical service and the surgical service.

Physical medicine is now a recognized specialty. Information has been received from authoritative sources that an American Board of Physical Medicine is to be established in the near future. In order to qualify medical officers in this field, there is being established a professional training course of six months duration in a large metropolitan medical center. After completing this course, individuals will be assigned to physical medicine services in general hospitals for applicatory, on-the-job training, leading to completion of the requirements for board certification.

If the size of the standing Army is placed at 850,000 as recommended by General Eisenhower, there will be a need for about 59 medical officers who are qualified as specialists in physical medicine. At the present time, only a very small number of medical officers are so qualified. In order to build up a group of competent well-qualified medical officers for professional assignments in physical medicine, the Army offers an unusual opportunity to enter a career in this specialty.

The Surgeon General has personally pointed out that officers who have recently begun specialty training, or who have not chosen their medical specialty, should carefully consider the broad field of physical medicine as a professional career with a bright future. For medical officers of the Regular Army who have been on extended assignments of an administrative nature, but who now desire to obtain training in a promising specialty, physical medicine warrants major consideration. For other medical officers (Army of the United States, Officers' Reserve Corps, and National Guard) who anticipate remaining on active duty for an indefinite period, the same holds true. For further details interested medical officers should communicate directly with the Director, Physical Medicine Consultants Division, Office of The Surgeon General, War Department, Washington 25, D. C.

Eben Carey Honored

Dr. Eben J. Carey was guest of honor at a dinner given by Marquette University School of Medicine in recognition of his twenty-five years of service to the school as professor and director of the department of anatomy. He became dean in 1933. Dr. Carey is a member of the Council of Physical Medicine of the American Medical Association.

Brigadier General W. Lee Hart

The degree of Doctor of Humanistic Letters, an old award rarely presented but given mainly for high ideals and service to humanity, was recently given by the Southwestern Medical Foundation, Dallas, Texas, to Brig. Gen. W. Lee Hart, recently retired from the Army Medical Corps after nearly forty years of service. The award was made at the annual commencement of the medical college and was granted to General Hart ". . . because of noble achievements and distinguished public service. . . ." Gen. Hart is an honorary member of the American Congress of Physical Medicine.

National Society for Medical Research

The National Society for Medical Research, a clearing house for information on medical studies and discoveries, has been organized under the sponsorship of the Association of American Medical Colleges with the cooperation of 101 national scientific organizations.

Dr. Anton J. Carlson, President of the National Society for Medical Research and Professor Emeritus of Physiology at the University of Chicago, has announced the establishment of the Society's headquarters office in Chicago, Illinois. Ralph A. Rohweder, 1946 President of the Chicago Junior Association of Commerce and former consultant and editor for the National Safety Council, has been appointed Executive Secretary.

The Society has as its purpose the advancement of research in medicine, biology, pharmacy, dentistry and veterinary medicine.

Dr. Carlson emphasized that an important function of the Society is to analyze and expose the propaganda of small but highly vocal groups which object to the use of animals in the experiments without which medical science would still be in its infancy.

Every year doctors and researchers must take time from their vital duties to defeat legislation proposed by these groups which would hamper

(Continued on page 575)

ARCHIVES of PHYSICAL MEDICINE
OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL MEDICINE

EDITORIALS

MANIPULATIVE TREATMENT

The article of Travell and Travell[1] on Therapy of low back pain by manipulation in the current issue of the ARCHIVES offers not only an impressive elucidation of this difficult subject, but is clearly of special interest as a proof of the belief that the sacroiliac joint can be displaced and cause a reaction of the sacral plexus while the subluxation lasts. Many orthopedic surgeons contend that displacement of the sacroiliac joint cannot take place as the result of stresses applied to it, but those who have had continued experience in treating low back pain must agree with the authors that many cases showing this syndrome are often immediately relieved of their main symptoms, not only as regards pain, but also by the restoration of movements previously restricted. This sudden relief of pain and disability following a successful manipulation of the lumbosacral region surely implies that a reduction of some slight displacement has resulted. This is further emphasized in the cases described which were seen shortly after the onset of the symptoms, as the sudden relief of the pain and disability could not be due to freeing of adhesions which are so commonly a cause of low back disability in the cases of long standing.

The object of manipulation of a joint is to put it through the widest range of movements of which it is capable in all directions without resistance or assistance of the muscles which act on it. The particular method of manipulation depends on several factors, the main movements aimed at being based on the normal range of the joint to be manipulated. The movement should be carefully designed and never be haphazard.

Morton Smart[2] emphasizes that a slipped sacroiliac joint which has existed for a long time is almost certain to be accompanied by adhesions in the periarticular tissues, particularly the areolar tissues and in many cases where a manipulation has successfully restored the joint to its normal position, symptoms may continue to be present because at the same time adhesions have not been successfully freed. He points out that manipulation of a back which has been diagnosed as a subluxated sacroiliac joint may successfully relieve the patient of all symptoms not only because the sacroiliac joint has been replaced but also because a slight displacement of one of the lateral joints between the fifth lumbar and the first sacral which was clinically undiscovered, has been replaced at the same time. This type of displacement according to Morton Smart is much more common than is usually believed and it is difficult to differentiate between it and a displaced sacroiliac. Subjects with low back pain for any length of time develop a postural lumbar kyphosis and great relief of pain always follows gradual manipulation to restore the normal lumbar lordosis.

The subject of manipulation, hitherto so much neglected by the medical profession is being gradually clarified by some of these recent contributions and deserves more extensive application by competent hands as suggested by the authors.

1. Travell, J., and Travell, W.: Therapy of Low Back Pain by Manipulation and of Referred Pain in the Lower Extremity by Procaine Infiltration, Arch. Phy. Med. 27:537 (Sept.) 1946.
2. Smart, Morton: Manipulative Surgery, Brit. J. Phys. Med. 2:66 (March) 1939.

THE TASK OF EDITING THE ARCHIVES.

When the readers of the ARCHIVES receive each issue in the familiar brown envelope towards the end of each month, being busy physicians, they may not even bother to take it out for several days. But many of them undoubtedly realize that it takes intricate work of many months to "get out" each issue on time. First there are the scientific contributions. Each and every one of the papers published in the ARCHIVES has to be passed on by at least three members of the Editorial Board. Papers may be offered by men who may be good clinicians but often not so good as writers. It is the trying task of the central office to keep the papers offered for publication circulating on somewhat of a schedule among the editors living in various places between the Atlantic and the Pacific, to receive and to correlate their suggestions and criticisms as to these papers and perform the sometimes delicate task to make some of the authors conform to these suggestions. Quite a few of the papers offered, of course, cannot be accepted for one reason or another. Then the central office has also the task of checking bibliographies for correctness in style and contents and to straighten out the many angles connected with each of the illustrations or tables submitted—as the authors of these will very well remember. Next the editor of the month has to receive a complete set of galleys of the papers available for each issue at least three weeks ahead of publication time so to be able to make his selections and to plan the editorials to be written. These editorials have to be sent in good time to be "set up" as part of the page proofs of the issue. Each item of the news section may represent a great amount of correspondence and may require often complicated checking as to accuracy, and so do the book reviews and other special items. Abstracts of literature are expected to be up to date and require constant viligance and weeks of preparation.

The printers want all this material on time to be able to set up the issue, make revisions of the proofs, print the issue and mail it out on schedule.

Many of the readers and most of the authors of the ARCHIVES are, of course, fully aware of the problems connected with the appearance of each monthly issue and realize the numerous difficulties which may interfere with the publication schedule. However, it is felt that at least once in a while it may be desirable to point out some of these pitfalls—psychological or technical, for the information of all concerned. This is especially timely in this issue of the ARCHIVES. The average reader may wonder that appearing as it does two weeks after an Annual Meeting which promises to be the most stimulative and successful one in many years, it contains not a single item or paper relating to this meeting. The explanation is simply that all of its contents had to be in hands of the printers by the time the meeting opened. So please continue to appreciate and help to lighten the burdens of the Editorial Board and the central office and look forward to the October issue with its full account of the 1946 Victory Convention.

Medical News

(Continued from page 572)

or stop the work of the medical profession. Secretary-Treasurer of the National Society for Medical Research is Dr. A. C. Ivy,* Head of the Department of Physiology at Northwestern University. On the Board of Directors are R. B. Allen,* University of Illinois; Alfred Blalock, Johns Hopkins University; C. S. Burwell, Harvard University; F. J. Carey, Marquette University; L. R. Chandler, Stanford University; W. C. Davison, Duke University; R. E. Dyer, National Institute of Health; H. S. Gasser, Rockefeller Institute; E. W. Goodpasture, Vanderbilt University; J. G. Hardenbergh, American Veterinary Medical Association; J. C. Hinsey, Cornell University.

Victor Johnson, American Medical Association; C. D. Leake, University of Texas; E. M. MacEwen, University of Iowa; W. S. McEllroy, University of Pittsburgh; B. O. Raulston, University of Southern California; A. M. Schwitalla, St. Louis University; Isaac Starr, University of Pennsylvania; E. L. Turner, University of Washington; Floyd S. Winslow, Medical Society, State of New York.

National offices of the Society are at 25 East Washington Street, Chicago, Illinois.

*Formerly.

Hospitals Approved for Residency Training in Physical Medicine

[1]Los Angeles County Hospital, Los Angeles.
[1]Massachusetts General Hospital, Boston.
Mayo Foundation, Rochester, Minnesota.
Michael Reese Hospital, Chicago.
[1]Montefiore Hospital for Chronic Diseases, New York City.
[1]Mount Sinai Hospital New York City.
Passavant Memorial Hospital, Chicago.
[1]Presbyterian Hospital, New York City.
St. Luke's Hospital, New York City.
Stanford University Hospitals, San Francisco.
[1]State of Wisconsin General Hospital, Madison, Wisconsin.
[1]University of California Hospital, San Francisco.
[1]University Hospitals, Minneapolis, Minnesota.
Walter Reed General Hospital, Washington, D. C.
University of Kansas Hospital, Kansas City, Kansas.
[1]Goldwater Memorial Hospital, New York City.
[1]Hospital for Joint Diseases, New York City.
[1]Cleveland Clinic Foundation, Cleveland, Ohio.
[1]Hospital of the University of Pennsylvania, Philadelphia.
[1]Medical College of Virginia, Hosp. Div., Richmond, Va.

1. Indicates temporary approval.

Appointments at Temple

Dr. George C. Henny, has been appointed professor of medical physics and head of the department of physics at Temple University School of Medicine and Hospital, and Dr. Margaret T. C. Collins, Philadelphia, has been named director of the laboratories and lecturer in endocrinology.

Meeting of the Association of American Medical Colleges

The fifty-seventh annual meeting of the Association of American Medical Colleges will be held at the Edgewater Gulf Hotel, Edgewater Park, Mississippi, Oct. 28, 29 and 30, 1946.

Harvard Discontinues Course for Training in Physical Therapy

Harvard Medical School is not offering another Physical Therapy Course. Children's Hospital is planning to offer a six months' course in Infantile Paralysis and Orthopedics to graduates of approved schools who would like experience in this field. There will be no academic credit, only a certificate for special work and the number admitted will be limited.

The Cerebral Palsy Program of the National Society for Crippled Children and Adults

It has long been recognized that the problem of cerebral palsy presents a challenge which is not being adequately met. How to meet that challenge effectively is of special concern to the National Society for Crippled Children and Adults and its affiliated state and local societies, as a nationwide organization dedicated to the task of serving all those who are physically handicapped.

Concrete and aggressive steps toward the accomplishment of this task were taken when the National Society, in a drive to extend and intensify its nationwide program for the cerebral palsied, took three important actions: First, to create a special cerebral palsy division as an integral part of its central headquarters office, to be staffed by persons professionally qualified in the field, to give guidance and consultation in the development of facilities throughout the country. Second, to authorize the setting up of a national advisory committee to assist in the development of the program and to insure the availability of professional guidance at all times. Third, to establish a special cerebral palsy fund, to make possible training of personnel and research in the field.

Dr. James J. Smith Named to Be Loyola Medical School Dean

Appointment of Dr. James J. Smith to be dean of the medical school of Loyola university has been announced by the Very Rev. James T. Hussey, S. J., president. Dr. Smith was former director of physiology for the 8th air force medical establishment in which he held the rank of lieutenant colonel. Before entering the army in 1941 he was assistant instructor in clinical pathology at the University of Illinois medical school here. He assumed his new duties Aug. 1, succeeding Dr. Francis J. Braceland, who has been on leave during the war as a captain in the navy. Dr. Braceland, school authorities said has indicated his desire not to return to his old post.

Changes in Requirements School for Physical Therapists University Texas School of Medicine

The University of Texas School of Medicine is making the following changes in its School for Physical Therapists:

1. Beginning with the 1947 class, the duration of the course will be twelve months instead of nine. This includes vacation time.
2. Beginning with the 1948 class, the three years of college will replace the present two years requirement. The physical sciences must include three semester hours of physics.
3. Graduate nurses and physical education graduates who present three semester hours of physics will be given preference in these groups.
4. The tuition will be $141.00 for Texas students; non-residents will be charged additional fee.

Medical School Items

University of California Medical School. — Legislation has been enacted in California appropriating $7,500,000 to establish a new state university medical school in Los Angeles.

University of Oklahoma School of Medicine. — The Alumni Association of the School of Medicine has created the Fund for the Advancement of Medical Science. It will sponsor an endowment fund of $3,100,000 to establish a research institute.

New York University College of Medicine. — The Robert Trubek Fellowship in Rheumatic Diseases recently established at the college is open to graduate physicians with at least two years of previous training in internal medicine, or its equivalent. The fellowship provides a one-year, non-resident appointment at an annual stipend of $2,500, and is renewable for an additional year by mutual agreement.

Medical College of Alabama. — The Medical College of Alabama, Birmingham, has now acquired, under full ownership of the University of Alabama, the relatively new $4,000,000 Jefferson Hospital in Birmingham. This institution will become the teaching hospital of the medical school.

Henry Kaiser Finances Kabat-Kaiser Institute for Neuromuscular Rehabilitation

Henry J. Kaiser, West Coast industrialist, has announced that he will finance a young Washington physician, Dr. Herman Kabat, in founding the Kabat-Kaiser Institute for Neuromuscular Rehabilitation in the U. S. Capital. Mr. Kaiser's action is said to have been taken in gratitude for treatment given to his son. It is understood a chain of Kabat-Kaiser institutes is planned.

The Journal of General Education

This Journal will be published quarterly by the University of Iowa. It is intended to serve instructors and administrative officers in liberal arts colleges, professional schools, teachers colleges, junior colleges and the secondary schools. The editor is Earl James McGrath.

Proposed Medical Research Center

Major General Norman T. Kirk, Army Surgeon General, announced proposed plans for an Army Medical Research and Graduate Training Center.

The proposed Army center would be located at Forest Glen, Maryland. It is the site of National Park College which was converted to a convalescent hospital during the war to care for Walter Reed General Hospital patients. When the project is approved it will take approximately 12 years to construct.

Information gleaned in all Army laboratories now scattered throughout the United States and Panama would become available at the center. And rare maladies encountered would be subjected to expert civilian and military scientific study as patients suffering such diseases would be transferred to a 1,000 bed general hospital which will be established in the center for clinical observation.

Veterans Administration Doubles Its Staff of Doctors

Dr. Paul R. Hawley, medical director of the Veterans Administration, reports that the agency has increased its staff of full time doctors almost 50 per cent in the last six months. He disclosed that on June 21 it had 3,651 doctors, which was 1,202 more than it had on January 3. During the past six months the agency had added 379 dentists and 2,785 nurses. It now has on its roll 612 dentists and 7,985 nurses.

Federal Security Agency Reorganized

With the reorganization of the Federal Security Agency Federal Security Administrator Watson B. Miller welcomed members of the United States Employees Compensation Commission, the Childrens Bureau and the Division of Vital Statistics, transferred to the Federal Security Agency and announced major changes in Agency organization and assignments of duty.

The Federal Security Agency, he stated, will be reconstituted under four main operating branches and six staff officers. The four branches are: (1) Social Security Administration, taking over the activities of the Children's Bureau, transferred from the Department of Labor. Arthur J. Altmeyer has been appointed Commissioner for Social Security to head this new unit. Miss Katherine Lenroot, Chief of the Children's Bureau will continue in that post. (2) Education, consisting of the existing Office of Education will be under the direction of the Commissioner of Education. John W. Studebaker will continue to head this office.

(3) Public Health, consisting of the U. S. Public Health Service. Freedmen's and St. Elizabeth's Hospitals will be under the direction of the Surgeon General.

Thomas Parran, Surgeon General of the Public Health Service will continue in this capacity.

(4) Office of Special Services, a new office in-

cluding the newly created Bureau of Employees' Compensation and the Employees' Compensation Appeals Board which succeed the U. S. Employees' Compensation Commission, abolished by Reorganization Plan No. 2; the Food and Drug Administration; and the Office of Vocational Rehabilitation, War Property Distribution.

American Hearing Society

On June 16, 1946 the members of the American Society for the Hard of Hearing voted to change the name of their organization to American Hearing Society.

Medicolegal Abstracts

Medical Practice Acts: Use of "M.D.," Drugs and Hemovitameter by Naturopath. — In a proceeding before the State Board of Medical Registration and Examination the defendant's license to practice naturopathy was revoked. On defendant's appeal to the circuit court, the board's order was reversed, so the board appealed to the Supreme Court of Indiana.

The defendant, a licensed naturopath, advertised himself as "Successor to C. R. Perdue, M.D., Dermatologist and Plastic Surgeon," and as "a physician of wide experience and well qualified to administer any form of treatment which may be needed." He also asserted that, among other degrees, he had a degree of "Doctor of Medicine." He prescribed pills, salves and other medicines and used a machine which he called a hemovitameter and about which he testified "The interior of a hemovitameter is just a lot of wires and different circuits to different contacts and connections. There is at least one radio tube in it. There are a number of resistance coils." This machine, he said, worked much like a radio. The operator would contact with a little fibroid plate under which there are two coils in which the magnetism is built up to the point at which it causes the fingers to stick lightly to that plate. Then by measuring the amount he can turn another dial which tunes in to that same circuit a blocking condenser until that magnetism is completely blocked out. By that means the dials are read as being the intensity of the disease of the patient's body for that particular setting. The detection of magnetism with one's fingers, the defendant explained, is by means of a traction through the plate to the coils underneath, the plate must be rubbed lightly, and it takes a lot of practice to operate the machine efficiently. After using this machine, the defendant told one patient on her first visit that she was not addicted to tobacco and that she had catarrh and a cancer of the colon. An engineer testified "It is impossible to build any machine dealing in frequencies or vibrations that will pick up vibrations regardless of their source that does not fall within the known spectrum from zero to three hundred million cycles per second. All those frequencies can be detected and measured with regular equipment. They cannot be detected by the human hand outside of those frequencies which cause burns, or light, or other physical manifestations observable to sight. It is absolutely impossible for the human hand to detect magnetism in any form simply because basically and fundamentally magnetism has no effect except on a very few metals and minerals."

The Supreme Court said that misrepresenting himself as entitled to practice medicine, prescribing drugs and medicines not permitted by his license, and misrepresenting the powers of his machine to credulous and unsuspecting sufferers who put themselves in his hands on the assumption that, from his being permitted to practice, he was skilled in diagnosis and treatment of diseases, was, of course, grossly immoral. The circuit court, on appeal, had only to determine whether or not the board conformed to the statutory procedural method and whether or not its decision was supported by substantial evidence. From the undisputed evidence, the Supreme Court concluded that the board's decision was substantially supported. Accordingly the judgment for the defendant was reversed and an order entered revoking the defendant's license. — State Board of Medical Registration and Examination v. Scherer, 46 N. E. (2d) 602 (Ind., 1943). — Rep. J. A M. A. 131:701 (June 22) 1946.

Col. Doan Succeeds Col. Carpenter as Executive Officer, SGO

Col. Howard V. Doan, MC, was designated Executive Officer, SGO, on May 28 to succeed Col. Robert J. Carpenter, MC, who held that position since December 21, 1943.

Fellowships Available for Study of Rheumatic Fever

The American Council on Rheumatic Fever of the American Heart Association announces that it will entertain applications for American Legion fellowships for the study of rheumatic fever. Applications will be accepted from recognized institutions concerned with the study of rheumatic fever and rheumatic heart disease. The American Legion fellowships for the study of rheumatic fever have been made available by a grant from the American Legion and the Women's Auxiliary of the American Legion.

Cease and Desist Orders
Abstracts of Certain Federal Trade Commission Releases

Airflow Arch-Ezurs. — C. H. Stemmons, trading as C. H. Stemmons Manufacturing Company, Kansas City, Mo.; complaint issues Jan. 5, 1943; order issued July 3, 1944. Order directed respondent to cease representing that the device performs any corrective function in treating foot conditions, or that its use will relieve painful conditions caused by weak arches or other forms of foot disability, that it will provide exercise for the foot or have any value in exercising or restoring weak or flabby muscles; that it will pre-

vent spreading of the feet, relieve foot or body fatigue, create an air suction through the shoes, or is so designed as to fit every individual foot. In March, 1938 the same respondent had entered into a stipulation with the Commission, agreeing to cease representing that his Airflow Arch- Enzurs are the greatest invention of modern times for foot ailments, end foot suffering after all else fails, relieve pain instantly and bring quick relief to persons suffering from flat feet, weak arches, metatarsal pains, burning calluses, bunions, swollen ankles and tired, aching feet, provide nature's way of foot correction and give more foot comfort than any other arch support on the market.

Rex Diathermy Machine. — Rex Diathermy Corporation, Brooklyn; complaint issued April 4, 1944; order issued July 1, 1944. Order directed the concern to discontinue the following misrepresentations for its device. That, when used by unskilled laymen for self diagnosed conditions, it constitutes an effective treatment of, or remedy for, rheumatism in its various forms in all parts of the body, as well as bronchitis, or alleviation of pain resulting from bodily disorders, unless specifically limited to conditions which do not involve acute inflammatory processes, glandular structures or the special senses, or that diathermy treatments are used for the treatment of diseases by all physicians and in all hospitals. Order further directed respondent to cease disseminating any advertisement which did not clearly reveal that it is unsafe to use the device for any condition unless and until a competent medical authority has determined by diagnosis that the use of diathermy is indicated, has prescribed the frequency and rate of application of the treatments, and the user has been adequately instructed by a trained technician in the use of the mechanism. In this connection the Commission described the Rex Diathermy Machine as being a portable device of the kind "commonly known as the spark-gap type diathermy."—J. A. M. A. **131**:858 (July 6) 1946.

Control Flow and Adjuster. — Callie E. Morris, trading as Control Products Company, Brooklyn; complaint issued Feb. 26, 1938, and amended complaint March 22, 1941; order issued March 21, 1945. Order directed this concern to cease disseminating any advertisements which represent that the device in question is a proper treatment for constipation, may be safely used in colonic or vaginal irritations, has any value in the treatment if hemorrhoids, fistula, kidney and bladder trouble, cystitis, Bright's disease, consumption, cancer, appendicitis, rheumatism, varicose veins, gastric ulcer, vaginal disorders and others, or that its use in connection with the concern's "Clentol Antiseptic Nodules" or any other tablets of similar composition has bactericidal effects or any other therapeutic value. The order further directed the respondents to discontinue any advertisement which did not reveal that the use of the device for colonic irrigation by attaching it directly to the water faucet may result in sufficient pressure to burst or perforate the intestine, particularly when appendicitis or an ulcerous condition is present, resulting in peritonitis or other serious or irreparable injury to health; or that other injuries may follow the use of the device when the faucet pressure forces vaginal infection into the fallopian tubes.

Electrical Facial Rejuvenator, Colran Electro-Lifter and Certain Cosmetics. — Delmar M. Randall, trading as the Colran Institute, Houston, Texas, and Mervyon E. Randall, his wife; complaint issued Jan. 9, 1943; order issued Oct. 22, 1944. Order directed the respondents to discontinue the following advertising misrepresentations in the sale of their products, which included the above-named devices together with "Cleansing Oil," "Contact Solution," "Special Cleansing Solution" and "Conditioning Oil," the combination constituting "The Colran Method of Non-Surgical Facial Rejuvenation"; That face lifting can be accomplished without surgery, that use of the products in question will lift the face, remove wrinkles or sagging skin or replace such conditions with revitalized, youthful skin, or eliminate signs of age or rejuvenate the skin. The respondents were further ordered to cease using the words "Rejuvenator" or "Lifter" or any terms of similar import to designate or describe their device.—J. A. M. A. **131**:1020 (July 20) 1946.

Radio-Active Uranium Isotopes Open Up Unexplored Processes of Life

An "x-ray" of the dynamic processes of living now is available to medical research.

Isotopes as tools of medicine have been compared to the microscope and the x-ray, General Kirk pointed out. But these were useful largely for study of the organs of life whereas the isotopes open up the largely unexplored field of the processes of life. It is in this respect, rather than as actual remedies for anything, that the substances are of preeminent importance today.

"Medical scientists," said General Kirk, "would like to know more about how calcium and phosphorus are used in building teeth and in uniting fractures, how iodine is used by thyroid gland, exactly what happens when one or more of the glands of internal secretion starts malfunctioning, how the process of wound healing is carried out."

Some of these radio-active isotopes may find a place as specific "medicine," medical officers point out. The most notable example to date is radio-active phosphorus, known chemically as P32. Phosphorus is an important constituent of both bones and blood. It is carried in the blood stream through the entire body. When the radio-active isotope is administered the blood stream is subjected to a radium-like bombardment. Consequently when the isotope was produced first in the cyclotron about seven years ago there were high hopes that it might mark a long advance towards the conquest of leukemia—a cancer-like condition of the blood in which there is an enormous increase in white cells which, however, do not have the ability of ordinary cells of this sort to combat infection. Despite various complications and disappointments, use of P32 now is generally accepted as the treatment of choice for

certain forms of leukemia. It brings about long remissions of the disease. It cannot be considered a "cure" for any leukemic condition in the present stage of the therapy but it is admittedly a long step in advance in the treatment of one of the most difficult maladies known to medical science.

The element iodine tends to concentrate in the thyroid gland. Since radio-active iodine behaves exactly the same as ordinary iodine in the body it was logical that it should be tried in malignant growths of the thyroid. Results to date have been somewhat puzzling and inconclusive. The same is true of other radio-active isotopes which have been tested for specific therapy.

The nucleus of an atom is made up of protons, electrons and neutrons. Revolving around the nucleus somewhat as planets revolve around the sun, are electrons. There are precisely the same number of electrons revolving around the nucleus as there are protons in the nucleus which are not balanced by nuclear electrons. The number of outer electrons is the atomic number.

But there may be an extra neutron in the nucleus. It weighs precisely as much as a proton. It is electrically neutral. Hence it does not leave room for an extra outer electron. The atomic number remains the same. Element 92, which is uranium, remains uranium so long as there are 92 outer electrons. But with an extra neutron in the nucleus it weighs more. This heavier uranium is known as an isotope. Chemically it acts precisely the same as any other uranium.

For reasons not clearly understood various nuclear combinations are unable to stick together and break up with considerable violence. They then are radio-active, shooting out radiations which can be detected by means of various devices. Chief of these is the so-called Geiger counter. By means of it the presence of radio-active atoms anywhere in the body can be detected. For example, a person is given something containing radio-active copper, by mouth. The counter will enable a physician to follow the course of this copper through the entire process of assimilation by the body.

Medical Care for Veterans in Own Home Towns, Passed Last Week, Expected to Place Hospitals on Sound Basis *

Among the superlatives which are frequently used to describe the life of an American soldier—he is the highest paid, best equipped, best fed, best dressed soldier in any army—the most important of all is the fact that he receives the best medical care in the world.

In planning for general hospitals in rural areas, public health authorities estimate the need for two hospital beds for every thousand of the population, yet in many localities the scattered facilities available often do not provide even a fraction of the estimated requirements. Without adequate hospital facilities doctors frequently find themselves in the position of craftsmen who possess ability but not tools.

Where modern hospitals do not exist, the young physician who, during the war, participated for the first time in "teamwork medicine" and had available all of the modern methods of treatment, frequently feels it is impossible to give his patients adequate care.

A number of these young physicians have reported that they simply cannot-conscientiously practice with the limitations which often confront them because, as one has said, "I know that if I had the proper facilities that I could give my patients better care and save lives that this way are sometimes lost."

According to the Department of Agriculture, only 18 per cent of the professional and related medical personnel in the country live in farm or village localities despite the fact that 43 per cent of the nation's population is rural.

Before the war the average rural county had one doctor for each 1,700 persons, while the average big city had one doctor to each 650 persons. Authorities say that there should be at least one doctor to each 1,000 persons, but it was found that some farm counties had only one doctor for each 5,000, and in other counties the shortage of physicians was even more acute.

Recently Congress passed and sent to the President for his signature, the Hill-Burton bill which offers the beginning of a solution to both the problems of the doctor and those of the patient.

The new Hill-Burton law will be an important factor in raising the level of medical care and its distribution throughout the nation. The $375,000,000 cost to the Federal Government is considerably less than that of "Operation Crossroads," and is certainly not too much for this country to make as a "down payment" on a program which will greatly improve the health of the nation.

* Rusk, New York *Times*.

Report of the Meeting of the British Association of Physical Medicine on the "Kenny Treatment."

A film on the Kenny concept and treatment of infantile paralysis was shown in London, under the auspices of the British Association of Physical Medicine and by courtesy of the Royal Society of Medicine, on July 30th, 1945. Miss Kenny was present at the meeting.

Lord Horder said the Association was pleased to have been given the opportunity of showing Miss Kenny's film but, owing to the controversy which had surrounded her unorthodox concept of the disease, it should be understood that both the British Association of Physical Medicine and the Royal Society of Medicine disclaimed all responsibility for the views therein expressed.

Dr. Philippe Bauwens said that Miss Kenny's personal observations and her experience of the treatment of infantile paralysis had led her to lay emphasis on the treatment of some peripheral disturbances which the medical profession held to be entirely secondary to the involvement of the

central nervous system. The polemic, to which Lord Horder had alluded, arose from her insistence on the importance of these manifestations, for which she had created a new terminology and a method of treatment; these, from the orthodox point of view, appeared to be irrational, if not futile. Whereas Miss Kenny recognized the existence of cord lesions and shared the fatalistic attitude of the medical profession in regard to these, she maintained that much could be done for the patient by accepting the proposition that there were other aspects of the disease, which urgently required treatment in the acute stages if the best functional results were to be achieved.

Dr. Bauwens said that, having had the advantage of seeing the film already, he intended to exercise the privileges of the critic who had had a pre-view. The film, in his opinion, embodied many of the worst features of a "Hollywood Movie." There was about it an exaggerated sentimentality, and also an offensive sensationalism, which should find no place in a film professing to be of scientific value. This was all the more regrettable since it constituted an abuse of the very medium best capable of illustrating those points to which Miss Kenny desired to draw attention, of explaining those terms which had caused such confusion, and of putting on record not only the method of treatment but also its results. His remarks might appear to be somewhat discourteous, but they were made with the object of warning the audience, so that they might not be obsessed by certain defects which might cause prejudice to cloud judgment.

The film, which was then shown, throughout features Miss Kenny and begins with a summary of her conception of the pathology of infantile paralysis. Neuropathology is studiously avoided, whereas attention is drawn to signs and symptoms related to movement. During the summary she demonstrates what she terms "spasm," "alienation of muscle," "incoordination of muscle" and "affections of the skin, subcutaneous tissues and fasciae."

Miss Kenny claims that the film provides irrefutable proof that the condition alleged to be a flaccid paralysis of muscles is brought about, in a large part if not wholly, by an inability of these muscles to act, caused by the contracture not only of opposing muscles, but of the overlying fascia, subcutaneous tissues and skin. This she sets about to combat from the very inception of the disease, which, she holds, can be recognized at an early stage by noting these signs.

The film shows the progress of a number of cases from the acute stage onwards, and points of special interest are demonstrated at various stages. They include: (1) the early detection of the involved tissues and their distribution, according to the "Kenny concept"; (2) their treatment by means of hot moist compresses to reduce pain and tenderness; (3) manipulation of the contracted tissues and the recapturing of lost function in apparently paralyzed or only partially paralyzed muscle.

By way of conclusion, the end results of some cases treated by the orthodox method are shown side by side with those of some treated by the Kenny method. In this, the orthodox method appears in a very unfavorable light.

It is undoubtedly this last and reprehensible part of the film which has earned the critical remarks of Dr. Bauwens' introduction. The medical profession fully realizes that many patients with widespread paralysis make excellent spontaneous recoveries, whereas in other cases involvement of a single limb leaves the patient crippled. On this score the implications underlying the comparisons are misleading. Whether they have been prompted solely by enthusiasm or by other motives is of no moment; they are valueless in the eyes of the medical profession and might constitute a source of unhappiness and anguish if seen by crippled sufferers. This portion of the film merits condemnation for sheer bad taste.— Brit. J. Phys. Med. **8**:152 (Sept.-Oct.) 1945.

Physical Therapy Film

The National Foundation for Infantile Paralysis has just completed a film on physical therapy entitled "Accent on Use." This is a sound film, 16 mm., and available for distribution by request to the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

Annual Meeting

The Forty-Eighth Annual Convention and Postwar Conference of the American Hospital Association will be held in Philadelphia during the week starting Monday, September 30, 1946.

General Kirk, Col. Gardner Received Brazilian Awards

Honorary memberships in the Brazilian Academy of Military Medicine were recently bestowed upon Major General Norman T. Kirk, The Surgeon General, and Colonel Leon L. Gardner, MC, Director of Army Medical Library.

The coveted honors were awarded General Kirk and Colonel Gardner following a recommendation by Major General Florencio de Abreu, The Surgeon General of the Brazilian Army. General de Abreu and his party inspected medical installations in the Zone of the Interior early this year on an extended tour of the country.

BOOK REVIEWS

PERIPHERAL VASCULAR DISEASES. By *Edgar V. Allen,* B.S., M.A., M.D., M.S. in Medicine, F.A.C.P., Division of Medicine, Mayo Clinic, Assoc. Prof. Medicine, Mayo Foundation, Graduate School, Univ. Minnesota; Diplomate of the American Board of Internal Medicine; and *Nelson W. Barker,* B.A., M.D., M.S. in Medicine, F.A.C.P., Division of Medicine, Mayo Clinic, Assoc. Prof. Medicine, Mayo Foundation, Graduate School, Univ. Minnesota; Diplomate of the American Board of Internal Medicine; and *Edgar A. Hines,* Jr., M.D., B.S., M.A., M.S. in Medicine, F.A.C.P., Division Medicine, Mayo Clinic, Assoc. Prof. Medicine, Mayo Foundation, Graduate School, Univ. Minnesota; with Associates in the Mayo Clinic and Mayo Foundation. Pp. 871, with 386 illustrations, 7 in color. Cloth. Price, $10.00. Philadelphia: W. B. Saunders Company, 1946.

The authors point out that one of the poorest terms in medical use is peripheral vascular disease. There are many peripheral vascular diseases and the term peripheral vascular disease should not be used to include all of them. It would be much better if the disease were designated more specifically, such as chronic occulsive arterial disease, chronic venous insufficiency or vasomotor disorders. It would be better yet if a still more specific designation were used such as thromboangiitis obliterans or sudden arterial occlusion. Some physicians consider that the term peripheral vascular disease applies only to the upper and lower extremities; in its broadest sense, however, the term peripheral vascular disease applies to disease of any of the blood vessels outside the heart and includes diseases of the lymphatics as well.

This book is based largely on the experiences of the authors and their colleagues of the Mayo Clinic. The past twenty years have been a period of great activity in the study of peripheral vascular diseases. There are naturally many controversial points particularly with regard to therapy. The authors indicate most of these controversial points but express definitely their own opinions in order that the reader is not left in a maze of controversy.

It is impossible to separate consideration of the extremities, sharply, from the rest of the body since ischemia of the feet, for example, may be the result of occlusion of the aorta. In this book arterial hypertension and vascular diseases of the central nervous system have not been included. Hypertension, although a peripheral vascular disease, is a subject about which there is much controversy and to which entire books have been devoted. A discussion of vascular disease of the central nervous system is also not discussed as it would involve a consideration of neurology. The technic of the various operations on the sympathetic nervous system is also omitted as these are discussed in surgical books. Vascular diseases of certain viscera have been omitted inasmuch as they are primarily linked with other diseases. Otherwise peripheral vascular disease is discussed in the broader sense of the term.

This book is highly recommended to the physician who is treating patients with peripheral vascular diseases and to the student who is more interested in historical development, physiology, pathology and methods of investigation.

COMMON AILMENTS OF MAN. Edited by *Morris Fishbein,* M.D., Editor, Hygeia, The Health Magazine. Cloth. Price, $1.00. Pp. 177. New York: Garden City Publishing Co., Inc., 1945.

The common ailments of mankind, sixteen in number, are discussed by various authors. Among these are the common cold, backache, headache, arthritis, anemia, etc. The book has been designed to further the layman's knowledge of the ills that are commonly seen. The causes, characteristics and progress are discussed as well as the means that science has found to combat them. It is a book that can be recommended for the layman for general information relative to the various medical subjects presented.

PHYSIOLOGICAL CHEMISTRY. By *J. F. McClendon,* Ph.D., Research Professor of Physiology, Hahnemann Medical College, Philadelphia, Pennsylvania; formerly Professor of Physiological Chemistry, Medical School, University of Minnesota, Minneapolis. Seventh Edition. Price, $4.25. Pp. 462, with 83 Figures. St. Louis: C. V. Mosby Company, 1946.

The author covers the field of physiologic chemistry in 432 pages and hence most of the subject matter is not dealt with as fully as would seem essential for medical students. However, for those desirous of reviewing the field this book should prove of great value. It would be an excellent text for students of dentistry, nursing and dietetics. The book is divided into two parts. A partial list of subjects discussed in part one is as follows: physical chemistry in its relation to physiologic chemistry; fats, phospholipins, galactolipins, sterols; carbohydrates; proteins; vitamins; enzymes; digestion and absorption; urine; blood; energy exchange; foods; and internal secretion. Part two is devoted to laboratory procedures and being placed in a separate section of the book will be greatly appreciated by the student. The author has avoided gravimetric methods when possible using in preference volumetric and colormetric methods. An unusual feature of the book is the chapter devoted to experiments which would be

of special interest to dental students. There is an appendix giving the international atomic weights and an excellent glossary of terms. The text is lucid and well written. Some of the diagrams used to illustrate the structure of the sugars is unique and the best this reviewer has ever seen. The publisher has certainly produced a book of excellent make-up.

DISEASES OF THE SKIN: FOR PRACTITIONERS AND STUDENTS. By *George Clinton Andrews,* A.B., M.D., Associate Clinical Professor of Dermatology, College of P. and S., Columbia U.; Chief of Clinic, Dept. Dermatology, Vanderbilt Clinic; Chief of Dermatology Clinic, Roosevelt Hosp.; Attending Dermatologist to Presbyterian Hosp. and Roosevelt Hosp.; Consulting Dermatologist and Syphilologist to Tarrytown Hosp.; Grasslands Hosp., Valhalla, St. Johns Hosp., Yonkers, Greenwich Hosp. and the Beekman-Downtown Hosp.; Fellow of the American Medical Association, of the American College of Physicians, and the New York Academy of Medicine; Member of the American Dermatological Association, the American Radium Society, and New York Dermatological Society, New York Roentgen Society, and the Manhattan Dermatological Society; Member of the Deutsche Dermatologische Gesellschaft and Corresponding Member of Societe Francaise de Dermatologe et de Syphiligraphie. Third Edition. Price, $10.00. Pp. 937 with 971 illustrations. Philadelphia and London: W. B. Saunders Company, 1946.

In a textbook on skin diseases one of the most important features is abundant illustrations. There are over 900 excellent photographs in this new edition which contribute much to its value. Revised material includes the use of sulphonamides and penicillin and streptomycin is also mentioned. Prescriptions are now written in the metric system as another innovation. This is recommended as a satisfactory text for students and as a reference source for the general practitioner. The specialist preparing for examination will find it an excellent up-to-date review.

SEX AND THE SOCIAL ORDER. By *Georgene H. Seward,* Ph.D., Department of Psychology, Simmons College; Formerly Assistant Professor of Psychology and Co-Director of the Psychology Laboratory, Connecticut College. Cloth. Price, $3.50. Pp. 301. New York and London: McGraw-Hill Book Company, Inc., 1946.

During the past generation extraordinary interest has centered around relations between the sexes. Students have tackled the problem from a great many angles. The biologist, experimenting with animals in laboratory and field, is primarily concerned with problems of internal mechanics. The social scientist, on the contrary, sees sex so largely as a cultural product that he often seems to neglect the physiologic basis. The psychologist whose task it is to explain the behavior of individuals throughout the evolutionary scale, must hold the balance between biological and social scientist. The author of this timely volume offers a new departure in the treatment of sex, a systematic integration of the biological and cultural approaches to the subject. The material is based on experimental data, supplemented by clinical cases and anthropologic field studies. Progress from lower to higher forms of life is shown to be associated with a shift in the balance between biological and social determiners of sex behavior. At the human level, the predominance of culture accounts for the wide range of variation in the evaluation of sex among different societies, both primitive and civilized. Within Western culture, the development of sexual behavior and social role through childhood, adolescence, adulthood and decline, is treated as a psychosomatic process consistently molded by group influences. The final chapter points out the trend for a redefinition of the roles of men and women in post-war society. A complete bibliography is attached.

MODERN ATTITUDES IN PSYCHIATRY. THE MARCH OF MEDICINE, 1945. Cloth. Price, $2.00. Pp. 154. New York: Columbia University Press, 1946.

This is the tenth series of volumes offering to the intelligent public an account of the yearly series of lectures given at New York Academy of Medicine on the modern aspects of the healing art and on its philosophical background. The present volume offers an exceptionally well integrated symposium on the problem of mental and nervous diseases. One of the lecturers of this series aptly states, "Twenty-five years ago it was fair to speak of psychiatry as the Cinderella of Medicine. Today she has become, at least in the eyes of some portion of the public, something of a "pin-up girl." Freudian ideas and Freudian terminology are now common elements in the everyday vernacular. The sanctum of the psychiatrist's office has been invaded by the playwright and Hollywood followed fast in his wake. The bones of no personage, no matter how ancient or honorable, are safe from exhumation by the pen of some psychiatrically minded biographer bent on revealing the emotional drives and aberrations of his helpless subject. The six main lectures of the volume are: Psychiatry in the history of medicine, the Linsly R. Williams memorial lecture, Iago Gladston, M.D., the Development of modern psychiatry, James H. Wall, M.D., the patient as a person: the social aspects of illness, G. Canby Robinson, M.D., present trends in psychiatry and the future outlook, Franz Alexander, M.D., psychiatry and the war, Col. William C. Menninger, M.C., psychiatry in everyday practice, the George S. Seidenburg, memorial lecture, Edward Weiss, M.D. These lectures portray vividly among other things how modern psychiatry has become the heir of all mental therapy that has come down through the ages even though, during the last two centuries there was a separation between medicine and the care of the mentally ill. Now military medicine in World War II has given an exceptionally clear picture

of the far-reaching effects of the mind on the body and now psychiatry is concerned not only with therapy but also with prevention. Psychiatrists, mental hygienists, educators and the enlightened public are keenly aware of the momentous problem this nation faces with the return of its war-mobilized youth. To them this book will bring considerable help and guidance.

DOCTORS EAST, DOCTORS WEST. By *Edward Hume*, M.D. Cloth. Price, $3.00. Pp. 278. New York: W. W. Norton & Co., Inc., 1946.

The sincerity one feels on reading these pages stands out as a fine example of a real physician. Dr. Hume was selected by the trustees of the Yale University Mission in 1905 to establish a medical college in China. The reception he received and his attitude and manner of handling the situation indicates beyond a doubt that the trustees knew whom they had selected to carry this assignment. We must remember that this was at a time when Chinese doctors though they had presumably never heard of laboratory tests were learned and skillful men. As so well expressed elsewhere Dr. Hume's method of bringing the light of Western science into this strange twilight was the extremely sensible one of being a good neighbor and keeping quiet. Although the Chinese admitted that the surgery of America was superior it was many years before anyone could be persuaded to have an operation on the skull or trunk. In China white is the color of mourning so imagine the mere custom of our American white for the doctor meeting with untold resistance. The book is highly recommended.

THE FACE IN HEALTH AND DISEASE: By *Max Thorek*, M.D., LL.D., D.Sc., F.I.C.S., F.I.C.A.; (C) F. B. C. S.; D. C. M.; K. L. H. (France); K. C. I.; C. O. St. Alex.; Med. Hon. Venezuela; Corresponding Member, Societe de Chirurgiens de Paris, Corresponding Fellow, Mexican Academy of Surgery; Corresponding Honorary Fellow, Peruvian Academy of Surgery; Fellow (Honoris Causa) Royal Surgical Society, Sofia, Bulgaria; Corresponding Fellow, National Academy of Medicine, Columbia, etc. Professor of Surgery, Cook County Graduate School of Medicine, Chicago; Attending Surgeon, Cook County Hospital; Surgeon-in-Chief, American Hospital of Chicago, Consulting Surgeon, Municipal Tuberculosis Sanitarium; International General Secretary, International College of Surgeons; Editor-in-Chief, Journal of the International College of Surgeons. Cloth. Pp. 750 with 636 illustrations, 8 colors. Price, $8.00. Philadelphia: F. A. Davis Company, Publishers, 1946.

According to the author the face is an open book which all can read. The plain observer can gain an amazing amount of knowledge through study of the face and the organs closely associated with it. The author who is an eminent surgeon, diagnostician and photographer, furnishes a wealth of material in print as well as in pictures about his thesis. This information covers in the first third of the volume historical considerations, embryology, evolution of the face, mimetic, musculature, the face in emotional and physical states, facial types, facial decoration, adornment and customs, congenital anomalies of the face. The subsequent chapters present the relation of the hair, the eye, the mouth, the teeth, the tongue, the nose and the ear to the face. The final chapters relate to: the face in physical diagnosis and in internal diseases, endocrinology and the face, dermatological conditions and the face, the face of diseased infants and children, the face in neurologic disorders and mental diseases and the face. The differential diagnostic aspects of the various conditions portrayed receive due consideration. This is a volume which general practitioners as well as specialists should study with interest and will use with advantage as a reference volume.

BURMA SURGEON RETURNS. By *Gordon S. Seagrave*. Cloth. Price, $3.00. Pp. 268. New York: W. W. Norton & Co., Inc., 1946.

The story of the war is still too fresh in our memories to forget the accounts of the retreat of Stillwell into India. Seagrave with his unit accompanied Stillwell. The present book covers the story of his journey back to Burma. As in his first best-seller we see the same sober, humorous doctor who met the challenges of jungle warfare with an assorted group of assistants always so loyal to Seagrave. Perhaps it was well intentioned to bring the book out at this time but it would seem better to have delayed its publication until the tremendous reception of the first book had dimmed somewhat. One's interest just cannot be kept to the degree with which one read the "Burma Surgeon."

PSYCHOANALYSIS THERAPY: PRINCIPLES AND APPLICATION. By *Franz Alexander*, M.D., and *Thomas Morton French*, M.D. (with Staff Members of the Institute for Psychoanalysis, Chicago). Cloth. Price, $5.00. Pp. 353, with one illustration. New York: The Ronald Press, 1946.

This publication contains the results of an investigative work to which every member of the Staff of the Chicago Institute for Psychoanalysis has in some way contributed. It represents an effort to define basis principles of a shorter and more efficient means of psychotherapy and to develop specific technics of treatment. Part I presents the scope of psychotherapy, the development of psychoanalytic therapy, the principle of flexibility, the principle of corrective emotional experience, the transference phenomenon, indications for therapy, planning psychotherapy, the dynamics of the therapeutic process. Part II presents the application of psychoanalytic therapy, efficacy of brief contact, emotional reeducation in supportive therapy, control of the transference relationship, analysis of character disturbance, alleviation of rigid standards, corrective emotional experience

through rapport, variations in goal and technic, the use of narcosynthesis in war neurosis. Psychotherapy is still more an art, requiring a constant intuitive response to the patient, than it is an exact science. The effort here has been to express this art in generally valid scientific terms, keeping in mind the fact that scientific formulations must of necessity lag behind the art of treatment. Addressed to psychiatrists, psychoanalysts, psychologists, general physicians, social workers and to all whose work is closely concerned with human relationships, this volume should be welcomed by all concerned because it is well written and well edited.

ELECTRON AND NUCLEAR COUNTERS: THEORY AND USE. By *Serge A. Korff,* M.A., Ph.D., Associate Professor of Physics and Supervisor of Physics Research College of Engineering, New York University, New York. Fabrikoid. Price, $3.00. Pp. 199, with illustrations. New York: D. Van Nostrand Company, Inc., 1946.

This volume deals with the operation and theory of electron and nuclear counters. In the preface, the author claims that this is the first book which discusses the internal mechanism of discharge in counters. Like most good books on theoretical and practical physics, it contains mathematical formulas to explain the theory. In this expanding field of nuclear physics and atomic energy, counters are of great value, in fact an essential, for measuring the intensity of the radioactive sources. Although this book would probably be of minor interest to a physician in the practice of physical medicine, it is a most valuable volume for a medical research worker in the field of radiology.

SKIN DISEASES, NUTRITION AND METABOLISM. By *Erich Urbach,* M.D., F.A.C.P., Associate in Dermatology, University of Pennsylvania School of Medicine; Chief of Department of Allergy, Jewish Hospital, Philadelphia. With the collaboration of *Edward B. LeWinn,* B.S., M.D., F.A.C.P., Associate in Medicine, Jewish Hospital, Philadelphia. Fabrikoid. Pp. 634, with 266 illustrations. Price, $10.00. New York: Grune & Stratton, 1946.

This book is timely and well written by a highly qualified author. It is divided into five parts: discussion of the biochemistry of the skin; discussion of dermatoses due to malnutrition with special reference to those due to vitamin deficiencies and food allergy; influence of the gastro-intestinal tract, liver and pancreas on the skin and vice versa; practical application of dietary therapy of dermatoses; and nutritional tables. The bibliography and the index are complete and well done. The author in a few instances becomes lost in a forest of details, leaving the reader hanging in mid-air, wondering what the author's point of view is after having quoted the literature. The discussion of food allergy as an important cause of dermatoses is excellent, since the author attempts to explain clearly the mechanism and side factors. However, there is lack of stressing the psychosomatic factor. The discussion on vitamin therapy may be misleading to some and thus convey too much faith in vitamin therapy, especially in dermatoses where there is no real acceptable and proven evidence of vitamin deficiency. This book will make a useful addition to the library of both dermatologist and internist.

IN THE DOCTOR'S OFFICE. THE ART OF BEING A MEDICAL ASSISTANT. By *Esther Jane Parsons,* Formerly Research Technician, Department of Biochemistry, College of Physicians and Surgeons, Columbia University; Formerly Instructor in Medical Office Procedures, Paine Hall School for Medical Assistants, New York City. Second Printing. Cloth. Price, $2.00. Pp 295, with illustrations by Jean McConnell. Philadelphia, London and Montreal: J. B. Lippincott Company, 1945.

Physicians vary according to their specialties as to the amount of medical assistance they need, yet almost every doctor desires a trained and efficient co-worker. He may need a secretary who can save his valuable time, a technician who can submit to him absolutely reliable reports and, above all, a person who will meet his patients with intelligence, tact, sympathy and integrity. The author of this volume offers a well-written, informative volume on the general requirements of a desirable and successful medical technician. It is chiefly written for technicians and its successive chapters contain pertinent information and seasoned advice in such a variety of topics as "Your Job Is a New One"—Duties and Opportunities of the Medical Assistant; "The Sum of What You Are"—Personality and Character; "To Your Health!"—Various Aspects of Hygiene for the Medical Assistant; "Doctors Are Also People"—Relationship Between Doctor and Medical Assistant; "Receiving the Patient—and Others"—Fundamentals in Human Relationships; "The Patient and You" — New, Referred, Former and Emergency Patients; "For the Record"—Securing and Giving Information; "In the Treatment Room"—Preparation of the Patient, Procedures for Assisting the Doctor, etc. Discussion of physical therapy in any form is wisely omitted. The author takes special pains to explain the position of the physician, so much so, that many physicians should take her sympathetic understanding to heart and amend some of their irritating ways. The book is illustrated with many cute and telling sketches. It is thoroughly practical and a copy of it should be used as a manual of study and reference in all medical offices where technicians are employed or are to be employed.

PHYSICAL MEDICINE ABSTRACTS

The Use of Infra-Red and Ultraviolet Lights in General Practice. Charles E. Fitzgerald.

South. M. J. **108**:177 (June) 1946.

Infra-red heat may be used wherever there is in progress: (1) inflammation, (2) infection, or (3) tissue repair, so long as it is used with care and understanding. However, where the condition is deep-seated and the form of heat is to be penetrating, probably diathermy or inductothermy is more advantageous.

As a specific, ultraviolet rays may perhaps be limited to calcium-phosphorus deficiency states. Other evidences of calcium-phosphorus deficiency such as tetany, spasmophilia and marasmus in infants, and osteomalacia and tooth decay in pregnant and nursing women, respond favorably to ultraviolet.

In acne and staphylococcus infections, ultraviolet rays play an important part, used with vaccine therapy. In staphylococcus infections ultraviolet has a powerful effect on the immunity processes. Local irradiation is beneficial because of definite aseptic action on staphylococci, and probably the best response to local skin infections is exemplified in the management of impetigo. Pityriasis does well under mild doses of ultraviolet. Acne vulgaris often responds well, but there are many recurrences. Sycosis clears up rapidly, as do lichen planus, tinea and the more chronic forms of eczema, after dischrages, crusts and ointments are removed. In ulcers and wounds, particularly those of badly nourished tissues, the results are good but slow. Results are good in recent wounds on normal tissues as, there occur stimulation of epithelial cells, vasodilation and sterilization. Ultraviolet is valuable in the treatment of nonpulmonary forms of tuberculosis, such as tuberculosis of the intestines, peritoneum and lymph nodes.

The Use of Diathermy in General Practice. C. G. Garrenton.

South. Med. & Surg. **108**:147 (May) 1946.

If the splint is removed daily and twenty minutes of diathermy applied, surprisingly good results will usually be achieved in tenosynovitis.

Diathermy is almost a specific for subdeltoid bursitis. If the splint is removed daily and twenty minutes of diathermy applied, surprisingly good results will usually be achieved in tenosynovitis.

Diathermy is an excellent method of relieving the pain and congestion associated with inflammation of the white firous connective tissue anywhere in the body.

Diathermy in pelvic inflammation conditions gives much to the apparent gratification of the patients. It seemed to give much relief before the advent of the sulfa drugs and penicillin, and its use in conjunction with these drugs is justified.

Diathermy treatment is excellent for the relief of the pain of pleurisy, allowing deeper breathing.

In neuritis, radiculitis and neuralgia medical diathermy is a welcome adjunct to general treatment.

The best application is to the frontal and maxillary sinuses, but if there is not adequate drainage the pain may be increased by the congestion. The causes of backache are legion, but most of them yield nicely to diathermy treatment.

The Effect of Sunlight on Dark Adaptation. Brant Clark; M. L. Johnson, and R. E. Dreher.

Am. J. Ophth. **29**:828 (July) 1946.

Cases of night blindness attributed to exposure to excessive sunlight have been reported from time to time over a period of many years. Although in most of these cases some dietary deficiencies may have been a causative factor, it seems likely, in view of recent reports on night visual disturbances occurring in military personnel, that exposure to bright sunlight may well have been an important contributing factor.

Individuals exposed to sunlight for three to four hours a day over a period of two weeks show a marked elevation of the night visual threshold immediately following exposure. The degree of elevation persisting overnight is sufficient to cause approximately a 50 per cent loss in night visual efficiency. Furthermore, it appears that persons exposed to sunlight for extended periods daily, without protection to their eyes, require in excess of one hour of adaptation to achieve a practical maximum of night visual efficiency. Exposure to brilliant sunlight has been reported as the cause of night blindness that is more or less permanent. However, the present studies on normal individuals indicate that the effects of daily exposure for three to four hours are only temporary, since the threshold returns to normal after one day's protection from the sun.

Present-Day Concepts of Fracture Management. Donald C. Conzett.

J. Iowa M. Soc. **36**:282 (July) 1946.

There are many types of treatment available following removal of the maintaining apparatus, all coming under the general classification of physcal therapy. This is a specialty of itself but every physician doing fracture work must have some knowledge of its use and misuse. Massage has its place, but it is actually a lazy person's means of exercise and usually some form of active motion is to be preferred. Heat is of great benefit for it is analgesic and a circulatory stimulant. Whether heat is administered by infra-

red, diathermy, whirlpool bath or moist applications, it should always be used to hasten return of function. The use of weights and pulleys has not had the usage that its value deserves. By the construction at home of simple devices which the patient can use, he may improve movement much more rapidly than awaiting his daily or semiweekly visit to the doctor's office for a quick treatment and then spend the interim in idleness.

A valuable piece of apparatus for the physician to have in his office, and quite economical, is a goniometer to measure range of motion in joints. It is difficult for one to remember what degree of motion was present the last time the patient was seen. With such an instrument the physician can measure and record the progressive improvement in the patient's condition. Its psychic effect is likewise worthwhile, because frequently a patient becomes discouraged at the lack of speed of recovery and he will watch with interest the progress made. A scale is kept on the wall in the examining room for use of patients who are restoring shoulder motion. The gain of an inch or two in reaching upward often sends a patient home knowing that his improvement is progressing. There are many other simple aids which tend to restore the mental as well as the physical well-being.

Progress in Cerebral Palsy. Eric Denhoff.

Rhole Island M. J. **29**:505 (July) 1945.

Cerebral Palsy is a syndrome in which neuromuscular dysfunction is the outstanding symptom. Specific symptoms may be spasticity, athetosis, ataxia, rigidity and tremors, singly or in combination. The diagnostic clinic depends on physicians with intimate knowledge of developmental behavior mechanism, as well as consultant neurologists, orthopedic surgeons and psychologists. Newer aids to diagnosis include psychometric tests, electromyography and electroencephalography. Functional self-sufficiency is the aim of any reeducational program. Physical therapy, utilizing relaxation, is the basis of good treatment. Curare and neostigmine, as adjuncts to physiotherapy promise to be of value in cerebral palsy.

Eye Discomfort Caused by Improperly Shielded Black Light Ultraviolet Lamps.

Council Report, J. A. M. A. **131**:287 (May 25) 1946.

The fluorescence excited by filtered ultraviolet radiation is finding a wide variety of uses by amateurs and by professional workers in examining minerals, documents and other objects; also in the examination and diagnosis and as a guide in the treatment of ringworm infection of the scalp. The source of ultraviolet rays is a high vapor pressure, "hot" mercury arc lamp. In the commercial so-called "black light" lamps the filter enclosure consists of a red-purple glass that transmits principally the powerful emission line of wavelength 3,663 angstroms and a small amount of the less intense visible (violet) emission line of wavelength 4,055 angstroms. Depending on the manner of operation of the lamp (especially the high powered, 250 watt lamps) both of these lines excite a hazy bluish white fluorescence ("fog") in the eye media that interferes with clear vision and fatigues the eye, causing discomfort and sometimes headache if the examination is too prolonged. But apparently no permanent damage ensues.

Goggles suitable to wear when working under high powered black light lamps should be made of glass that absorbs completely the emission line of wavelength 3,663 angstroms and preferably also (at least 90 per cent of) the line of wavelength 4,005 angstroms. To insure good visibility of the ringworm infected parts (for example the minute, fluorescing dots where hairs have fractured at the surface of the skin) such a glass should transmit not less than 85 per cent of the bluish to greenish fluorescent radiation (5,200 to 5,800 angstroms) emitted under "black light" irradiation. Such a glass may have a faintly yellowish tint, and any colloidal matter in the glass should not emit a strong fluorescence.

Evidently the remedy is to place the lamp in a suitable housing and to wear suitable goggles when making prolonged examination of objects excited to fluorescence by means of high powered "black light" ultraviolet lamps. However, it would be unfortunate if this information should be seized on for the sales promotion of sun glasses for outdoors wear.

Looking directly at the sun through a blue-purple glass (Corning 986, which transmitted some 70 per cent of all wavelengths from 2,900 to 3,700 angstroms) showed no appreciable fluorescence of the eye media, such as is produced by the 3,663 angstrom emission line of the high powered "black light" lamps. Hence there appears to be no need of wearing special sun glasses to eliminate these rays in sunlight.

Therapeutic Results in Rheumatoid Arthritis. Otto Steinbrocker.

J. A. M. A. **131**:189 (May 18) 1946.

The greatest advance in rheumatoid arthritis has been its recognition and segregation as a separate entity from other articular disorders. When uniform standards are followed universally, much inconclusive effort will be avoided and the results should prove more valuable in a shorter time.

It would advance research in this field if its official agencies sponsored a set of essential principles to guide therapeutic investigation in rheumatoid arthritis along the lines discussed here. An organized study of chrysotherapy under such auspices, conducted by several cooperating clinics taking part in a "blindfold" test, would prove invaluable.

To assure more informative and reliable therapeutic studies of agents advocated for rheumatoid arthritis, the following safeguards are recommended: 1. Inclusion only of cases definitely presenting the features of chronic rheumatoid arthritis according to the official classification of the American Rheumatism Association. 2. Segregation of patients in such studies according to the stages

of rheumatoid severity to break down each observer's results and to distinguish the response of each category. 3. Use of specific criteria for evaluating and grading results, such as the "yardstick" of Baylis and Hall. 4. Differentiating therapeutic effects on disease activity from influence on functional capacity. 5. A standard terminology of results, arrested, greatly improved, slightly improved, unimproved and worse, with definite significance for each. 6. Elimination of lumping in evaluating results of a therapeutic agent on trial. 7. Distinguishing specificity and palliative action. 8. A reasonable interval after treatment, the period of potential relapse, at least three years, to intervene, followed by confirmatory follow-up examination, before apparent "arrest" or "great" improvement" is acceptable for final reports. 9. Control series alternated with those receiving antirheumatoid medication.

Treatment of a Seriously Ill Asthmatic Patient. Haddon M. Carryer; Louis E. Prickman; C. K. Maytum, and Giles A. Koelsche.

J. A. M. A. 131:21 (May 4) 1946.

Baruch studied the deranged physiology of breathing in cases of asthma and advocated administration of therapeutic gases under positive pressure. This tends to relieve the increased negative intrapulmonary pressure of obstructive dyspnea and facilitates the entrance of therapeutic gases during inspiration. During expiration the bronchioles are less constricted. These benefits in turn lessen edema in the pulmonary tissues and vascular congestion. With these observations in mind, Baruch suggested oxygen and helium therapy for two hours daily even in the absence of acute respiratory distress. Such gases may be administered with a positive pressure hood or mask. Positive pressure of from 10 to 13 cm. of water is used in such cases, with a flow of from 6 to 9 liters of gas per minute.

Fracture Problems. Fracture Therapy by Internal and External Fixation. Bennett R. Parker, and William L. Culpepper.

Indust. Med. 15:90 (Feb.) 1946.

The use of skeletal pinning and external fixation is indicated in many compound comminuted fractures in the presence of infection and may be used with a wide margin of safety. This technic provides proper immobilization without involving the infected area, enabling the surgeon to carry out his selected technic for treatment of the infection.

When skeletal pinning and external fixation are used, size, position and angles of the pin should be determined by the problem of each individual case and not by specified predetermined positions to accommodate any mechanical appliance used for fixation or reduction of these fractures. Success of the procedure is determined by the ability of the surgeon to cope with the problem at hand and a selection of equipment which is universal and is flexible to meet the requirements of the existing conditions.

Realizing that at times there are high operative risks because of the necessity of immediate treatment, a method of treatment is selected which offers maximum immobilization with a minimum amount of trauma. In the experience of the authors the proper application of external skeletal fixation in selected cases offers a minimum amount of trauma, gives more safety and control of the patient and allows early active and passive motion.

Problem fractures which confront us today must be handled by a method which will give rigid fixation whether the fracture be new or old, infected or not infected, combined or with other fractures and complications, all of which makes the patient a surgical risk to a greater or lesser degree. The patients are afforded an opportunity of being ambulatory or at least the privileges of a wheel-chair, if additional complications will not permit the early ambulation. This allows motion, therefore increases all physiologic functions of the body which, in turn, enhances the patients' rate of ultimate recovery.

Roentgenograms should be carefully and accurately taken and read. They should always include the articulating surfaces of the contiguous joints of the fractured member. Local anesthesia is used in many cases, especially those which are considered poor surgical risks. The authors use external skeletal fixation in fractures in which infection is already present but point out that the fixation is placed well away from the infected area.

Skin Diseases in Industry. B. Crosthwaite.

Brit. J. Phys. Med. 9:34 (March-April) 1946.

Ultraviolet light may be used for general or local effects or for both. In infective conditions, such as boils, carbuncles and pustular dermatitis, lowered general resistance may be improved by a course of tonic irradiation. Chronic low grade skin infections by penicillin-sensitive organisms, exhibiting themselves in conditions of slowly forming abscesses and pustules, have been treated effectively by dosage of ultraviolet light to the stage of desquamation, in conjunction with the local application of penicillin ointment.

Cases of impetigo and of herpes zoster have responded rapidly to a few applications of ultraviolet light. Wet eczematous eruptions may show considerable improvement in response to ultraviolet irradiation after preliminary drying by shortwave infra-red treatment. Care must be observed, however, in regard to dosage, as if it is excessive there is a tendency to aggravate the condition. In chronic eczematous types ultraviolet light may stimulate the condition and render it more amenable to treatment.

In circulatory defects, such as erythema pernio, the early stages of Raynaud's disease and varicose dermatoses (including chronic ulcerations), general ultraviolet irradiation in conjunction with

localized infra-red treatment shows good results, if the ultraviolet irradiation is given towards the end of each infra-red treatment.

In the more chronic nonoccupational conditions, such as seborrhoea capitis, alopecia areata, sycosis barbae, acne, fungoid skin affections, ultraviolet irradiation carried out over a sufficiently long period gives excellent results.

Infra-red treatment is indicated in any type of skin affection for which increased and prolonged hyperemia or improved skin circulation is necessary; there are many occasions on which it can be used to advantage in an industrial medical department.

Burns, inflammation of the skin, incipient boils and infective conditions following skin trauma are benefited considerably when infra-red treatment is applied in the early stages; often more serious conditions can be aborted. The stages of suppuration and healing are also shortened by virtue of the deep and prolonged hyperemia brought about by infra-red treatment.

Sleep Posture: Its Implications. James McDonnell.

Brit. J. Phys. Med. 9:46 (March-April) 1946.

A survey of the medical literature of Great Britain has failed to reveal evidence that any member of the medical profession has ever written detailed instructions to a healthy person how to lie in bed. Owing to this absence of knowledge, a large proportion of the population assume a faulty sleep posture, with the result that a considerable number of painful disabilities have arisen, which have their pathologic origin in "passive trauma" of the costovertebral and intervertebral ligaments.

The Accurate Determination of Limb Volume.

Anot. Brit. J. Phys. Med. 9:55 (March-April) 1946.

A few years ago it was suggested that an easy and accurate method for the determination of the volume of limbs would be of clinical value. The occasion of this suggestion was an investigation of muscle volume in limbs which had sustained injuries to nerves. It was necessary to determine whether or not the application of galvanism was effective in preventing wasting of denervated muscle, whether or not there was a recovery of limb volume during treatment before or after the recovery of nerve function.

Preliminary attempts to determine the volume of limbs by measurement of the volume of water displaced by the immersion of the limb as far as some convenient fixed mark had not proved to be sufficiently accurate, owing to errors resulting from wetting of the skin; the surface tension properties of water, as well as various other factors, made the final results liable to an error of 10 to 20 cc.

Lupus Vulgaris. L. Forman.

Guy's Hosp. Gaz. 60:110 (April 27) 1946.

Local treatment with ultraviolet light, the method of Finsen and the various apparatus since designed to increase the intensity of light available, is capable in expert hands of producing excellent results with a smooth, healthy scar. Ultraviolet light destroys the tubercle bacilli just beneath the skin. By compression of the skin to empty the capillaries, light is able to penetrate more deeply into the substance of the granuloma and provoke a reaction of erythema and oedema which undergoes resolution and healing, due to the flooding of the zone with fresh lymph and inflammatory cells. This treatment demands a special department with expensive apparatus, trained personnel and frequent attendances — it may be for a year. The economic factor frequently precludes such a prolonged course and leads to failure to cure.

Rehabilitation in the Post-War Period. F. G. Ward.

Brit. J. Phys. Med. 9:38 (March-April) 1946.

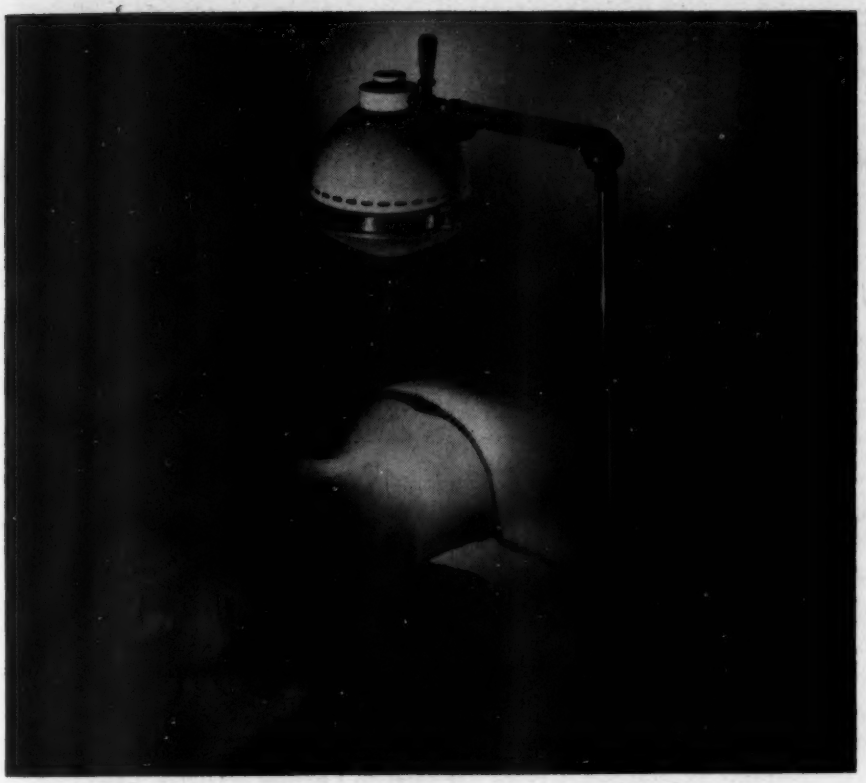
In peace, as in war, the strength of a country lies in its manpower. The urgent calls on manpower in the recent war have brought about a new conception in the treatment of the sick and injured. It is now not enough to get a man back on to his legs; he must be got back to his job, and this entails the prolongation of treatment beyond the hospital stage. During the recent war the three services secured this by setting up rehabilitation centers and convalescent depots. The essence of the treatment at these establishments was that the injured or convalescent man should get himself fit by his own supervised efforts and that he should regain full confidence in his fitness. In wartime the criterion of full recovery is fitness to fight; in peacetime, full earning capacity.

Hot Baths in the Treatment of Early Infantile Paralysis. A. David Gurewitsch, and Margaret A. O'Neill.

J. Pediat. 28:554 (May) 1946.

Until Sept 1, 1945, the authors report treatment of 35 patients with onset in 1943, 242 with onset in 1944 and 30 with onset in 1945. All patients of the 1943 outbreak had prolonged periods of packs before they were put into hot water. This group is valuable because it allows comparison of the responses of the patient to packs and to baths. It was the impression that the immersions in hot water speeded up the process of relaxation and elimination of pain from stretching.

The discussion is limited to the uses of hot baths in the treatment of muscle tightness and muscle soreness and does not discuss the use of pools in the treatment of the paralysis for ambulation and in reeducation of coordinated function.



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November 4, 5, 6 and 7, 1946

Section on Physical Medicine

Municipal Auditorium, Bay Front Park **Miami, Florida**

Wednesday, November 6th, 2:00 p. m.

1. **Chairman's Address: The Care of the Paralyzed Shoulder Girdle.**
   ROBERT L. BENNETT, M.D., Professor of Physical Medicine, Emory University Medical School; Director of Physical Medicine, Warm Springs Foundation, Warm Springs, Ga.
2. **High Resistive Low Repetition Exercises.**
   GEORGE D. WILSON, M.D., Chief of Physical Medicine, Branch Office No. 4, Veterans Administration, Ashville, N. C.
3. **The Use of Physical Medicine and Rehabilitation in Internal Medicine.**
   B. C. BLAINE, M.D., Assistant Chief, Branch Office No. 5, Veterans Administration, Atlanta, Ga.
4. **Effect of Rest, Exercise, Electrical Stimulation and Fatigue on Skeletal Muscle (tentative title).**
   CLINTON KNOWLTON, Ph.D., Assistant Professor of Physical Medicine in Charge of Research, Emory University Medical School, Atlanta, Ga.
5. **Physical Treatment of Arthritis.**
   HOWARD POLLEY, M.D., Section on Physical Medicine, Mayo Clinic, Rochester, Minn. (by invitation).
6. **Title and speaker to be announced.**

Election of Officers.

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PARTIAL LIST OF PAPERS SUBMITTED FOR PUBLICATION IN THE *ARCHIVES*

Frequency - Intensity Curves of Normal and Paralyzed Muscles in Man. Harry D. Bouman, M.D., Assistant Professor of Physical Medicine; A. J. Kosman, Ph.D., Assistant Professor of Physiology; Stafford L. Osborne, Ph.D., Associate Professor of Physical Medicine, Northwestern University Medical School, and Andrew C. Ivy, Ph.D., Vice-President in charge of the Chicago Professional Colleges of the University of Illinois, Chicago.

A New Approach to Physical Medicine. Ben L. Boynton, M.D., Shannon West Texas Memorial Hospital, San Angelo, Texas.

A Poliomyelitis Program in a General Hospital. Josephine H. Buchanan, M.D., Assistant Professor, Physical Medicine, Medical College of Virginia, Richmond, Va.

The Effect of Thermal Shock on the Voluntary Neuromuscular Apparatus. Eben J. Carey, M.D., Dean and Professor of Anatomy, Marquette University School of Medicine, Milwaukee.

The Council on Physical Medicine. Howard A. Carter, M.E., Secretary, Council on Physical Medicine, American Medical Association, Chicago.

Measurement of Clinical Ultraviolet. Clifton B. Cosby, M.A., Assistant Professor of Biophysics, Baruch Center of Physical Medicine, Medical College of Virginia, Richmond, Va.

Physical Medicine and Rehabilitation in the Veterans Administration. Donald A. Covalt, M.D., Assistant Medical Director, Medical Rehabilitation and Physical Medicine, Veterans Administration, Washington, D. C.

The Evaluation of Disability and Rehabilitation Treatment of Paraplegics. George G. Deaver, M.D., Clinical Professor of Medicine, New York University Medical College; Medical Director, Institute Crippled and Disabled, New York, N. Y.

The Evaluation of Disability and Treatment in Hemiplegia. Harold Dinken, M.D., Assistant Professor of Medicine, University of Colorado School of Medicine; Director of Physical Medicine, Colorado General Hospital, Denver.

Reliability of the Single Effort Muscle Test. Ellen N. Duvall, Ph.D., Research Associate, Physical Medicine, and Sara Jane Houtz, B.S., Instructor, Physical Therapy, Baruch Center of Physical Medicine, Medical College of Virginia, Richmond, Va.

Physical Medicine in the Navy. Comdr. Harry S. Etter, (MC), U. S. N., Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Muscle Strength and the Weather. Ernst Fischer, M.D., Professor of Physiology, Baruch Center of Physical Medicine, Medical College of Virginia, Richmond, Va.

Physical Medicine in Treatment of Rheumatoid Arthritis with Associated Xanthomas. Everill W. Fowlks, M.D., Chief, Physical Medicine Service, U. S. Veterans Administration, Portland, Oregon.

Crossed Learning. F. A. Hellebrandt, M.D., Professor, Physical Medicine and Acting Director; Sara J. Houtz, B.S., Instructor, Physical Therapy and Annie M. Parrish, M.S., Instructor, Physical Therapy, Baruch Center of Physical Medicine, Medical College of Virginia, Richmond, Va.

The Role of Circulatory Changes in the Effectiveness of Thermogenic Agents on Deep Tissues. Harry M. Hines, Ph.D., Professor and Head, Department of Physiology and William D. Paul, M.A., Assistant Professor of Medicine, Director Department Physical Medicine, State University of Iowa School of Medicine, Iowa City, Ia.

Results of Combined Fever and Insulin Treatment in Schizophrenia. William A. Horwitz, M.D., Associate in Psychiatry; Franz J. Kallmann, M.D., Associate in Psychiatry, and Nicholas Kopeloff, M.D., Assistant Professor of Bacteriology, Columbia University, College of Physicians and Surgeons, New York, N. Y.

A Progress Report on the Development of the Department of Physical Medicine at the University of Southern California. O. Leonard Huddleston, M.D., Associate Professor of Medicine, University of Southern California, school of Medicine, Los Angeles.

An Early Progress Report on the Development of the Department of Physical Medicine at the University of Illinois College of Medicine. H. Worley Kendell, M.D., Baruch Fellow Physical Medicine, Mayo Clinic, Rochester, Minn.

Physical and Nervous Factors in Experimental Hypertension. Frederick J. Kotkke, M.D., Baruch Research Fellow in Physical Medicine, Department of Physiology, University of Minnesota School of Medicine, Minneapolis.

Therapeutic Exercises in Management of War Injuries. Carl L. Levenson, M.D., Chester, Pa.

Ultraviolet, Infra-Red and Short Wave Dosimetry. Kurt S. Lion, D.Eng., Associate Professor, Massachusetts Institute of Technology, Cambridge, Mass.

Some Properties of Denervated Muscle. Sedgwick Mead, M.D., Boston, Mass.

Vertebral Changes Following Experimentally Produced Muscle Imbalance. Meryl Miles, M.D., Washington University School of Medicine, St. Louis, Mo.

Rehabilitation of Patients with Spinal Cord Injuries. Louis B. Newman, M.D., Physician in Charge, Medical Rehabilitation, Chief Physical Medicine Service, Veterans Administration Hospital, Hines, Ill.

The Optimum Exercise—Rest Balance in the Managment of Arthritis. George Morris Piersol, M.D., and Joseph L. Hollander, M.D., University of Pennsylvania, Philadelphia.

Comparison of Normal and Pathologic Patterns of Muscular Activity. Judith Partridge Price, M.A., Washington University School of Medicine, St. Louis, Mo.

A Study of the Kinematics and Dynamics of the Human Gait and Its Application in Poliomyelitis. Irving Rehman, Ph.D., Assistant Professor of Anatomy, University of Southern California, Los Angeles.

Cinematographic Roentgenographic Examination of Joint Movements. Russel Reynolds, M.D., London, England.

An Analysis of Certain Procedures Employed in the Physiatric Treatment of Amputations. Donald L. Rose, M.D., Silver Springs, Md., and George W. Soffe, M.D., Washington, D. C.

A Survey Method for Radiation Coverage of Infra-Red Generators. Leopold Rovner, M.S. (Physics), State University of Iowa, School of Medicine, Iowa City, Iowa.

Salient Observations on Physical Medicine in the Service. Herman L. Rudolph, M.D., Reading, Pa.

Vasomotor Adaptability and the Effect of Heat and Massage as Measured by the Cutaneous Temperatures of the Extremities of Normal Subjects and Patients Suffering with Rheumotoid Arthritis. Gordon M. Martin, M.D., University of Kansas Medical School, Kansas City, Kan.

A Community Rehabilitation Service and Center. Howard A. Rusk, M.D., New York, N. Y.

The Growing Importance of Physics in the Premedical and Medical Curricula. Francis O. Schmitt, Ph.D., Head, Department of Biology, Massachusetts Institute of Technology, Cambridge, Mass.

The Role of the Physiologist in Physical Medicine. Wilbur A. Selle, Ph.D., Professor of Physiology, University of Texas, School of Medicine, Galveston, Texas.

The Influence of Muscle Action Tissue Repair. Sir Morton Smart, London, England.

A Report of the Progress in the Two Years Basic Development of the Department of the Organization and Integration of Clinical Physical Medicine and Research and Education. William B. Snow, M.D., Assistant Professor of Medicine, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Physical Medicine in the Army. Benjamin A. Strickland, Jr., Lt. Col., M.C., Director, Physical Medicine Consultant's Division, Office of The Surgeon General, United States Army.

The Use of Inductothermy for the Stimulation of Nervous Tissue in Intact Animals. Robert Dewey Taylor, M.D., Cleveland Clinic Foundation, Cleveland, Ohio.

Psychiatric and Physiologic Studies on Fatigue: Preliminary Report. Arthur L. Watkins, M.D., Associate in Medicine, Harvard Medical School; Stanley Cobb, M.D., Psychiatrist-in-Chief, Massachusetts General Hospital; Jacob E. Finesinger, M.D., Assistant Professor of Psychiatry, Harvard Medical School; Mary A. B. Brazier, Ph.D., Research Fellow in Neuropathology, Harvard Medical School, Boston; Harley C. Shands, M.D., Harvard Medical School, Boston, and Gregory Pincus, D.Sc., Tufts College Medical School, Shrewsbury, Mass.

Temperature Equalization for the Relief of Pain. Herbert S. Wells, M.D., University of Minnesota Medical School, Minneapolis.

Physical Therapy in the Management of Tendon Repair. George D. Wilson, M.D., Asheville, N. C.

The Effect of Low Temperature on Fluid Movement and Capillary Permeability in the Forearm. Charles S. Wise, M.D., Harvard Medical School, Cambridge, Mass.; Ellen Brown, M.D., Harvard Medical School, Boston, and Edwin Wheeler, M.D., Massachusetts General Hospital, Boston.

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